SERV. 34 845

ORDER NO. AD9104111C8

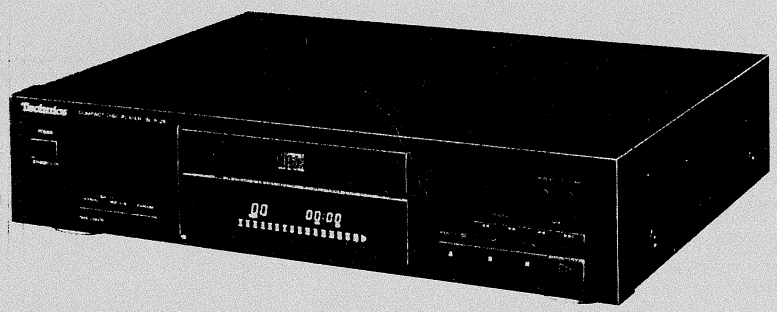
Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ28



Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

SL-PG100 MECHANISM SERIES (SODD110Z)

SPECIFICATIONS

■ **Audio**

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	85 dB
S/N ratio	95 dB
Total harmonic distortion	0.02% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

■ **Pickup**

Wavelength	780 nm

■ **General**

Power supply	
For (E, GN) areas:	AC 50/60 Hz, 230–240 V
For (GC) area:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Power consumption	14 W
Dimensions (W×H×D)	360×85×290 mm
Weight	2.9 kg

Note:

Specifications are subject to change without notice.

Weight and dimensions are approximate.

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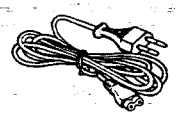
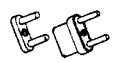
Technics

■ ACCESSORIES

- AC power supply cord ..... 1 pc.
  - (SJA187) ..... (E)
  - (RJA0004) ..... (GC)
  - (SJA173) ..... (GN)
- Stereo connection cable ... 1 pc. (SJP2249-3)
- L-type cable ..... 1 pc. (SJP2257T)
- Power plug adaptor ..... 1 pc. (For (GC) only) (SJP9215)





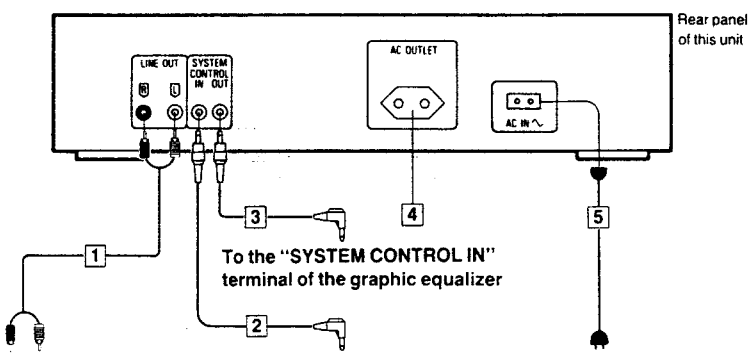
■ BEFORE USE

Be sure to disconnect the mains cord before adjusting the voltage selector.
Use a minus (−) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)
Note that this unit will be seriously damaged if this setting is not made correctly. (There is no voltage selector for some countries; the correct voltage is already set.)

■ CONNECTIONS

Notes:
- Turn off all components before making connections.
- See the operating instructions of the tuner for details.


Rear panel of this unit
LINE OUT
SYSTEM CONTROL IN OUT
AC OUTLET
AC IN
1
2
3
4
5
To the "SYSTEM CONTROL IN" terminal of the graphic equalizer
To the "CD" terminal of the amplifier
To the "SYSTEM CONTROL OUT" terminal of the cassette deck
To the "AC OUTLET" of the amplifier or to a household AC outlet

1 Stereo connection cable (included)

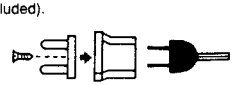
2 L-type cable (included)
This cable can be used only with a Technics cassette deck having the appropriate "SYSTEM CONTROL OUT" terminal.

3 L-type cable (not included)
This cable is included in a Technics graphic equalizer having the appropriate "SYSTEM CONTROL IN" terminal.

4 "UNSWITCHED" outlet
Power is always available, regardless of power switch. Audio equipment rated up to 50 W can be connected here.

5 AC power supply cord (included)
Note:
The configuration of the AC outlet and AC power supply cord differs according to area.

For (GC) only
If the power plug will not fit your socket, use the power plug adaptor (included).



■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780nm
Maximum output radiation power from pick up: 100μW/VDE

Laser radiation from the pick up lens is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

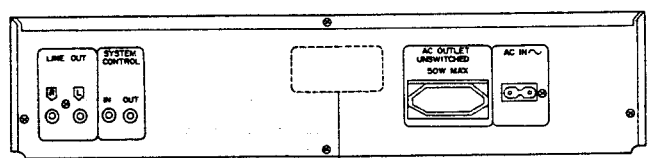
ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 100μW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

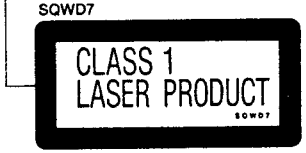


• Use of caution labels

Note: ○ Mark is used, × Mark is not used.

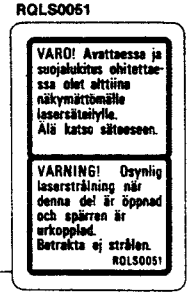
Areas	SQWD7	RQLS0021	RQLS0051
(E)	○	○	○
Others	○	○	×

SQWD7

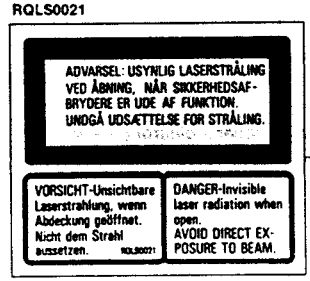


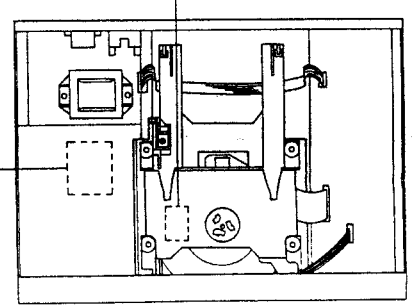
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

RQLS0051

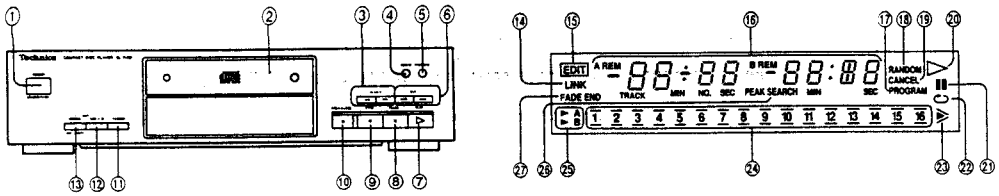

VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
RQLS0051

RQLS0021


ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet. Nicht dem Strahl aussetzen.
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
RQLS0021



■ LOCATION OF CONTROLS



Control section

① **Power "STANDBY ⏻/ON" switch (POWER STANDBY ⏻ /ON)**
This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the STANDBY ⏻ position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

② **Disc holder**

③ **Search buttons (◀◀ SEARCH ▶▶)**
These buttons can be used to move rapidly forward or backward on the disc during play. The search speed is slow when the button is pressed at first and becomes faster if the button is pressed and held continuously.

④ **Repeat play button (REPEAT)**

⑤ **Program button (PROGRAM)**
Pressing this button initiates the program play mode. You can then enter specific tracks using the skip buttons.

⑥ **Skip buttons (⏮ SKIP ⏭)**
These buttons can be used to skip tracks and to specify the track number or the desired recording time.

⑦ **Play button (▷ PLAY)**

⑧ **Pause button (❚❚ PAUSE)**

⑨ **Stop button (■ STOP)**
This button can be used to stop the disc play, as well as to cancel the various play modes.

⑩ **Disc holder open/close button (▲ OPEN/CLOSE)**

⑪ **Random play button (RANDOM)**
This button can be used to play the tracks on a disc in a random sequence.

⑫ **Tape side select button (SIDE A/B)**
When recording compact discs to tape, this button is used to switch the tape side for addition or cancelation of programmed tracks.

⑬ **Edit mode button (NORMAL, TAPE LENGTH)**
This button can be used to choose one of the edit modes or to specify the tape length to be used.

Indicators section

⑭ **Link indicator (LINK)**

⑮ **Edit indicator (EDIT)**

⑯ **Multi-display**
This display shows the track number and elapsed play time of the current track, or the remaining time of the tape while the unit is in the CD-edit mode.

⑰ **Program indicator (PROGRAM)**

⑱ **Random play indicator (RANDOM)**

⑲ **Program cancel indicator (CANCEL)**
Illuminates when the programmed track can be cancelled. (It can be operated only by the remote control transmitter included in the Technics tuner ST-X902.)

⑳ **Play indicator (▷)**

㉑ **Pause indicator (❚❚)**

㉒ **Repeat play indicator (↻)**

㉓ **"Over" mark (≫)**
This indicator lights if the total number of tracks on the disc is 17 or more.

㉔ **Track number indicator (1 – 16)**

㉕ **Tape side indicator (▶ A, ▶ B)**

㉖ **Peak search indicator (PEAK SEARCH)**

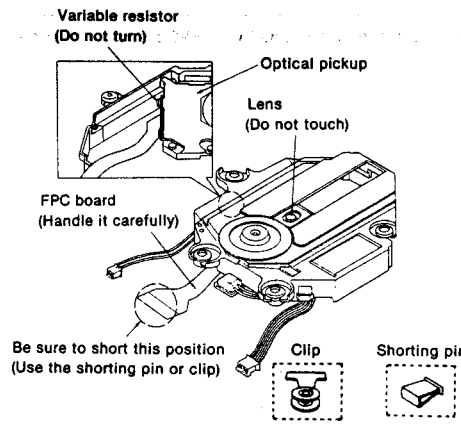
㉗ **Fade end indicator (FADE END)**
Illuminates when the unit is normal edit mode.

■ HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

- **Handling of traverse deck (optical pickup)**

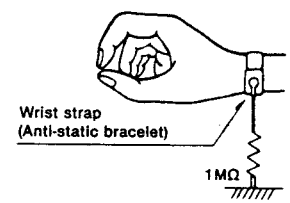
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

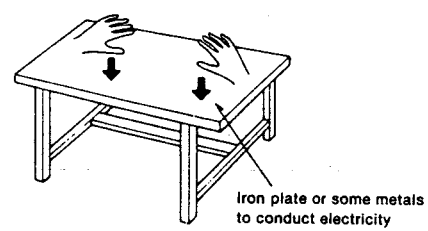


- **Grounding for electrostatic breakdown prevention**

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).





SL-PJ28

■ DISASSEMBLY INSTRUCTIONS

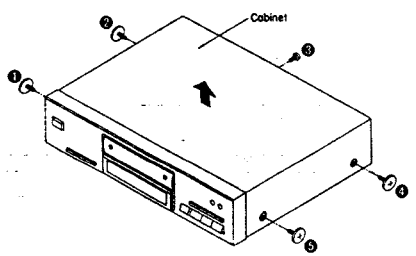
Warning: This product uses a laser diode. Refer to caution statements on page 3.

ACHTUNG: • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

※ This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref. No. 1 — Removal of the cabinet

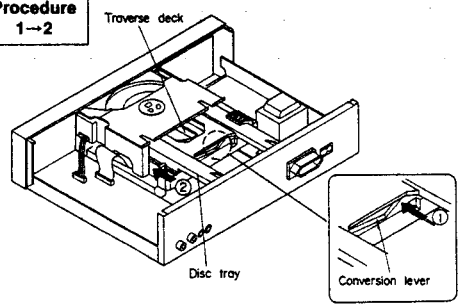
Procedure 1



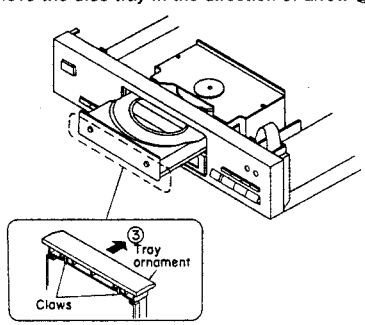
- Remove the 5 screws (❶~❺).

Ref. No. 2 — Removal of the front panel ass'y

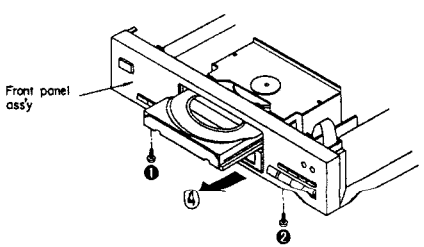
Procedure 1→2



1. Push the conversion lever fully in the direction of arrow ① and lower the traverse deck.
2. Move the disc tray in the direction of arrow ②.



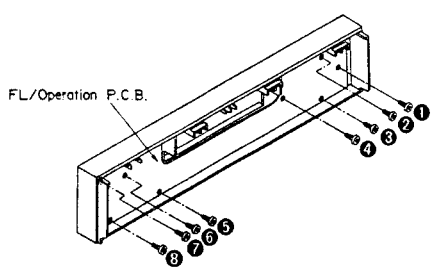
3. Release the 2 claws and then remove the tray ornament in the direction of arrow ③.



4. Remove the 2 screws (❶, ❷).
5. Remove the front panel ass'y in the direction of arrow ④.

Ref. No. 3 — Removal of the FL/operation P.C.B.

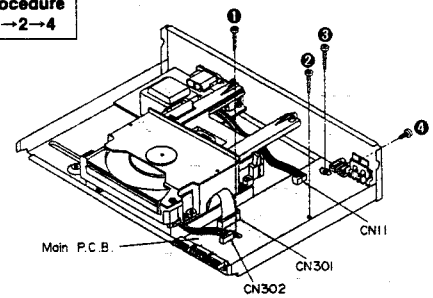
Procedure 1→2→3



- Remove the 8 screws (❶~❽).

Ref. No. 4 — Removal of the main P.C.B.

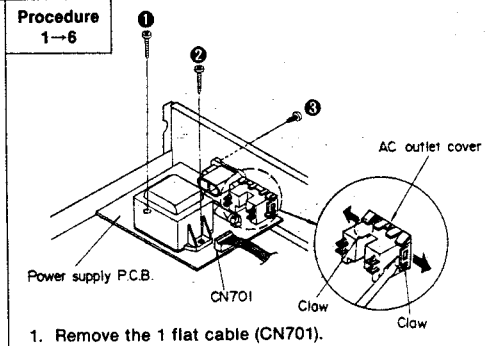
Procedure 1→2→4



1. Remove the 2 flat cables (CN11, CN301).
2. Remove the 1 connector (CN302).
3. Remove the 4 screws (❶~❹).

Ref. No. 5 — Removal of the power supply P.C.B.

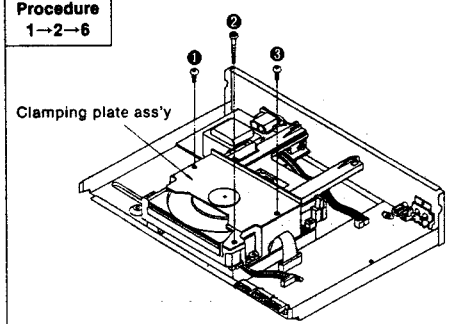
Procedure 1→6



1. Remove the 1 flat cable (CN701).
2. Remove the 3 screws (❶~❸).
3. Release the 2 claws of the AC outlet cover.

Ref. No. 6 — Removal of the clamping plate ass'y

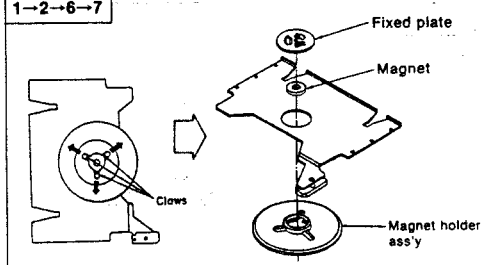
Procedure 1→2→6



- Remove the 3 screws (❶~❸).

Ref. No. 7 — Removal of the fixed plate, magnet and magnet holder ass'y

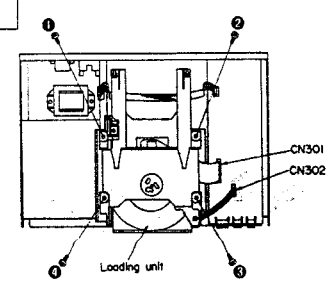
Procedure 1→2→6→7



- Release the 3 claws.

Ref. No. 8 — Removal of the loading unit

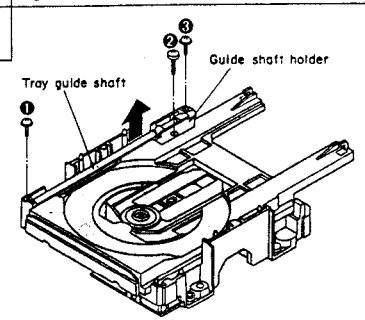
Procedure 1→2→8



1. Remove the 1 flat cable (CN301).
2. Remove the 1 connector (CN302).
3. Remove the 4 screws (❶~❹).

Ref. No. 9 — Removal of the tray guide shaft and guide holder

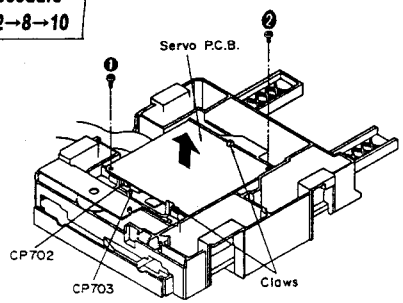
Procedure 1→2→6→8→9



1. Remove the 3 screws (❶~❸).
2. Remove the tray guide shaft and guide holder in the direction of arrow.

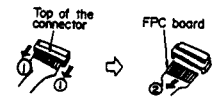
Ref. No. 10 — Removal of the servo P.C.B.

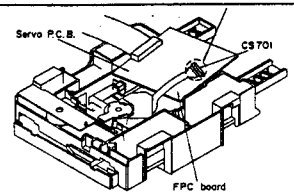
Procedure 1→2→8→10



1. Remove the 2 screws (❶, ❷).
2. Release the 2 claws.
3. Remove the servo P.C.B. in the direction of arrow.
4. Remove the 2 connectors (CP702, CP703).

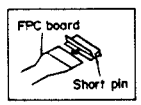
1. Push the top of the connector in the direction of arrow ①.
2. Remove the FPC board in the direction of arrow ②.





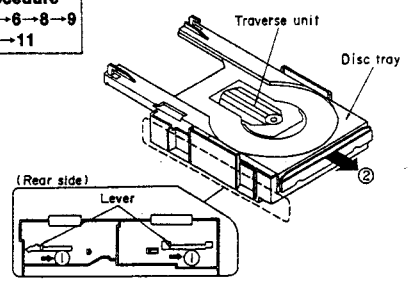
5. Remove the FPC board (CS701).

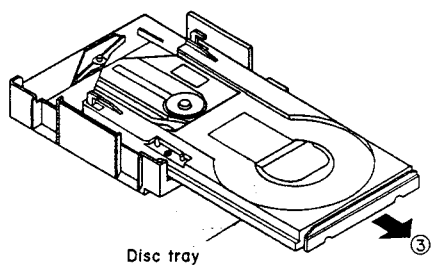
Caution:
Insert a short pin into the traverse unit FPC board. (Refer to "handling precautions for traverse deck" on page 5.)



Ref. No. 11 — Removal of the disc tray.

Procedure 1→2→6→8→9→11

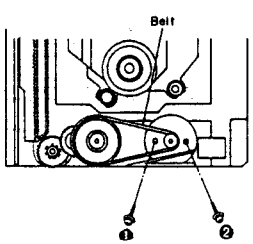


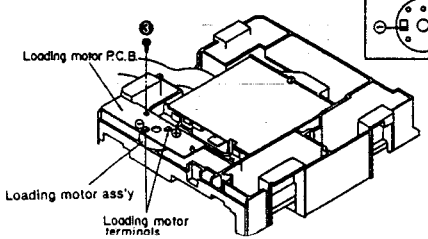


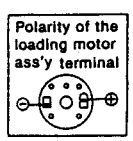
1. Push the levers in the direction of arrows ①. The traverse unit will lower and the disc tray will move slightly in the direction of arrow ②.
2. Pull the disc tray fully in the direction of arrow ③.

Ref. No. 12 — Removal of the loading motor and loading motor P.C.B.

Procedure 1→2→6→8→9→11→12





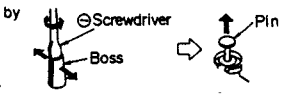


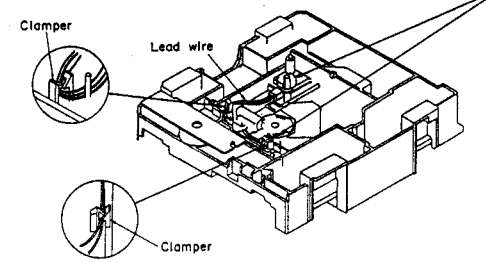
1. Remove the belt.
2. Remove the 2 screws (❶, ❷).
3. Remove the 1 screw (❸).
4. Unsolder the 2 terminals of loading motor.

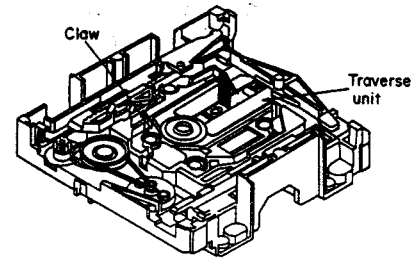
Ref. No. 13 — Removal of the traverse unit

Procedure 1→2→6→8→9→10→11→13

1. Widen the boss by using a regular screwdriver or similar object.
2. Pull out the pin.



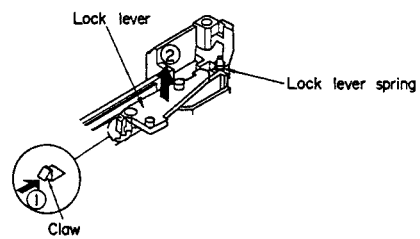




1. Remove the lead wire from clamper.
2. Remove the 2 pins.
3. Release the claw and then remove the traverse unit in the direction of arrow.

Ref. No. 14 — Removal of the lock lever

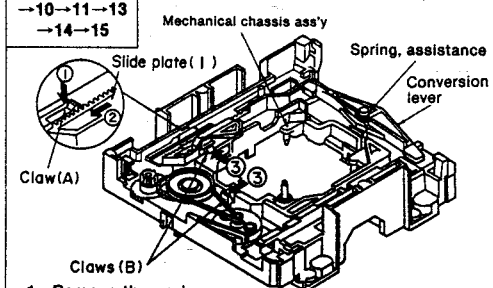
Procedure 1→2→6→8→9→11→14



1. Remove the lock lever spring.
2. Release the claw in the direction of arrow ① and then remove the lock lever in the direction of arrow ②.

Ref. No. 15 — Removal of the traverse chassis and conversion lever

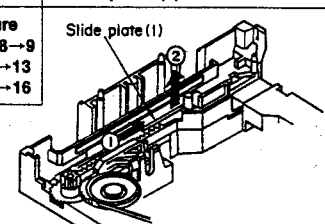
Procedure 1→2→6→8→9→10→11→13→14→15



1. Remove the spring.
2. Move the slide plate (1) in the direction of arrow ② while pushing the claw (A) in the direction of arrow ①.
3. Remove the conversion lever.
4. While pushing the claws (B) in the direction of arrow ③, lift the mechanical chassis ass'y.

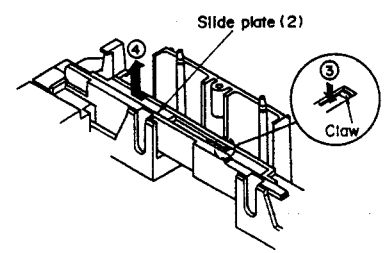
Ref. No. 16 — Removal of the slide plate (1) and slide plate (2)

Procedure 1→2→6→8→9→10→11→13→14→15→16



■ Removal of the slide plate (1)

- After moving the slide plate (1) fully in the direction of arrow ①, lift it in the direction of arrow ②.



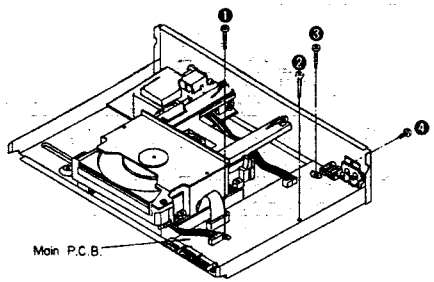
■ Removal of the slide plate (2)

- While pushing the claw in the direction of arrow ③, remove the slide plate (2) in the direction of arrow ④.

SL-PJ28

Ref. No. 17 **How to check the main P.C.B.**

Procedure 1→2→17

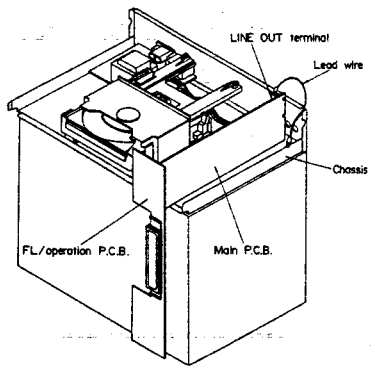


1. Remove the 4 screws (❶~❹).

• When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

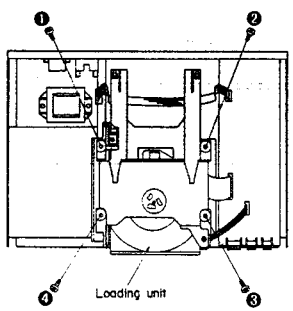
Cautions:

1. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire.

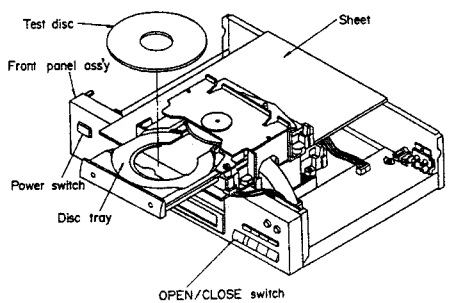


Ref. No. 18 **How to check the servo P.C.B.**

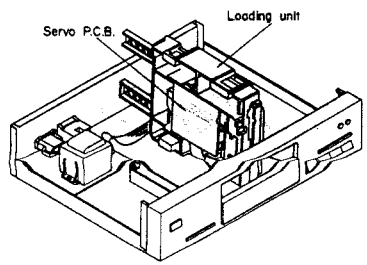
Procedure 1→2→18



1. Remove the 4 screws (❶~❹).



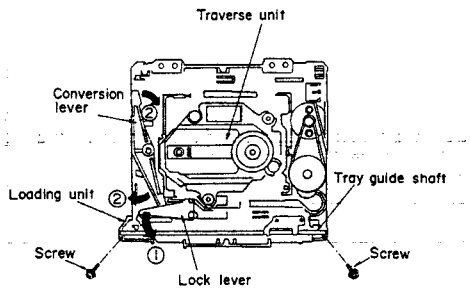
2. Attach the front panel ass'y to the unit.
3. Turn on the power switch and press the OPEN/CLOSE switch to open the disc tray.
4. Load the test disc and press the OPEN/CLOSE switch again to close the disc tray.



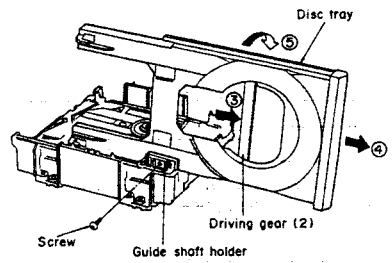
5. Place the loading unit sideways as shown in the figure right.

6. After placing the unit as shown right, perform check and adjustment of the foil on the servo P.C.B.

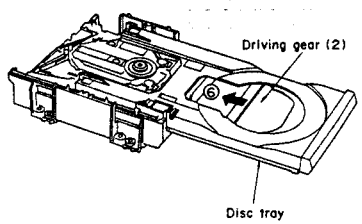
■ Installation of the disc tray



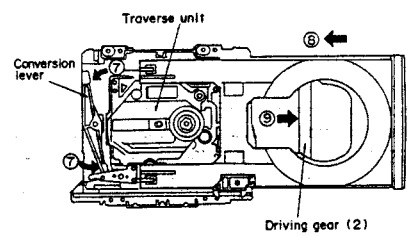
1. Move the lock lever in the direction of arrow ①, and then move the conversion lever in the direction of arrow ②.
   (The traverse unit will move upward.)
2. Use the two screws to mount the tray guide shaft to the loading unit.



3. Use the screw to mount the disc tray to the guide shaft holder.
4. Move the driving gear (2) fully in the direction of arrow ③.
5. Move the disc tray fully in the direction of arrow ④.
6. Tilt the disc tray downward in the direction of arrow ⑤.



7. Move the driving gear (2) fully in the direction of arrow ⑥.
8. While continuing to support the disc tray with your hand, slide the driving gear (2) as far as it will go in the direction of arrow ⑥. (Althought it will only slide a small amount, this will allow the loading gear to mesh together with the gear of the disc tray.)



9. Move the conversion lever in the direction of arrow ⑦.
   (The traverse unit will move downward.)
10. Move the disc tray fully in the direction of arrow ⑧.
    (When doing this, confirm that the driving gear (2) slides in the direction of arrow ⑨.)

■ MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 3.

Caution: During adjustment, never connect CH-2 probe's GND to any place for it may short V-Ref. line. (Connect CH-1 probe's GND to specified TP. described in each section.)

Measuring Instruments and Special Tools

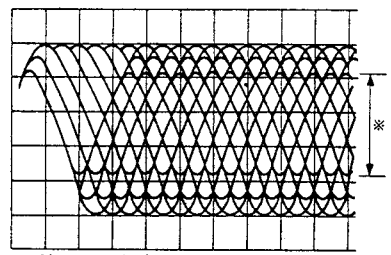
* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

* Musical program disc (ordinary)
* Extension cable kit (RFKZ0009)
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1: 1 probe).
* Allen wrench (M2.0) (SZZP1101C)
* Lock paint (RZZOL01)

(1) MECHANICAL ADJUSTMENT

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability if the traverse deck has not been replaced.

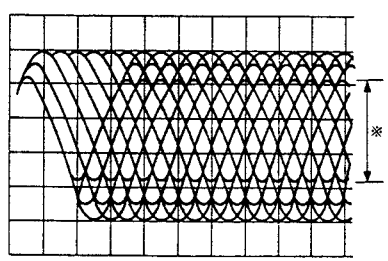
1. Connect the oscilloscope's CH. 1 probe across TP702 (RF) (+) and TP703 (V-Ref.) (−) on the servo P.C.B.
   Oscilloscope setting: VOLT.....200mV
   SWEEP .....0.5μs.
   Input coupling.AC
2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
   (Playing any other track is selected, the HEX screws can not be accessed.)
3. Leave the player in play mode, and place the traverse deck as shown Ref. No. 18 on page 10.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 2 on page 13)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



※ Most stretched eye pattern.

(2) BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TP702 (RF) (+) and TP703 (V-Ref.) (−) on the servo P.C.B.
   Oscilloscope setting: VOLT.....200mV
   SWEEP .....0.5μs.
   Input coupling.AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR701** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 1 on page 13)



※ *Most stretched eye pattern.*

(3) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* **Checking Skip Search**
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* **Checking Manual Search**
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* **Checking Playability**
1. Play the 0.7mm black dot and the 0.7mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

• **Adjustment points**

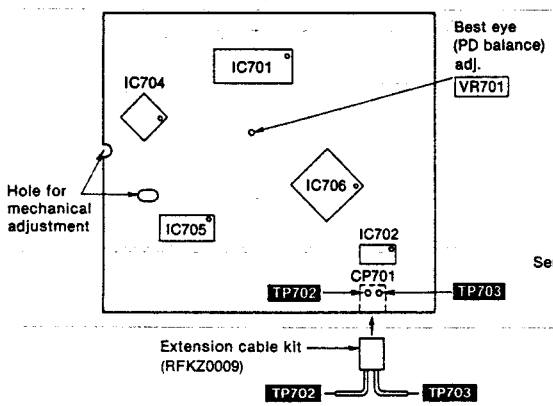


Fig. 1

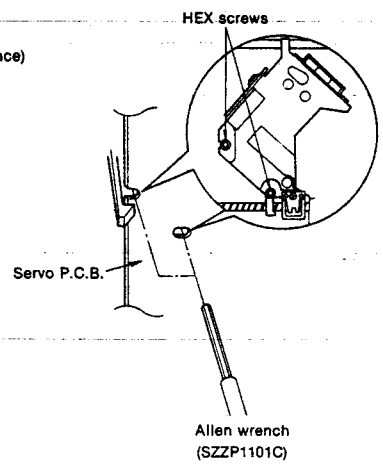
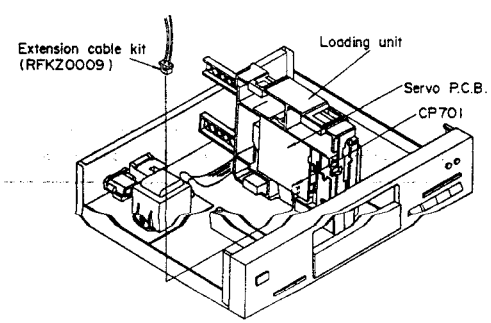


Fig. 2

• **How to install the extension cable (RFKZ0009)**

※ It may be difficult to insert the extension cable in the close condition of tray, therefore open the disc tray slightly and insert the extension cable.



■ TERMINAL FUNCTION OF IC'S

• **IC401 (MN1554PKL1): System control**

Pin No.	Mark	I/O Division	Function
1	MUTE RELAY	O	Muting output (Not used, open)
2	$\overline{\text{PLUNGER}}$	—	(Not used, open)
3	$\overline{\text{SYNC}}$	—	(Not used, open)
4	$\overline{\text{SIRQ}}$	I	(Not used, connected to power supply.)
5	BLKCK	I	Sub-code block clock (f=75Hz)
6	SQCK	O	Sub-code Q register clock
7	SBO	—	(Not used, open)
8	SUB Q	I	Sub-code Q data
9	RESET	I	Reset terminal
10	CLOSE SW	I	Disc holder "close" det.
11	OPEN SW	I	Disc holder "open" det.
12	REST SW	I	Rest det. terminal
13	NC	—	(Not connected)
14	$\overline{\text{CLOSE}}$	O	Loading motor "close" command signal
15	$\overline{\text{OPEN}}$	O	Loading motor "open" command signal
16 ∫ 24	NC	—	(Not connected)
25	V_{DD}	I	Power supply terminal
26 ∫ 30	NC	—	(Not connected)
31	FUTA SW	—	(Not used, connected to power supply)
32	MODE	—	(Not used, connected to GND)
33	STAT	I	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)

Pin No.	Mark	I/O Division	Function
34	$\overline{\text{TLOCK}}$	I	Optical servo condition (tracking) input
35	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
36	SENSE	I	Sense signal
37	$\overline{\text{RECV}}$	I	Data receipt command signal
38	$\overline{\text{SEND}}$	I	Data transmission command signal
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 ∫ 44	DATA 0 ∫ DATA 3	I	Key scan signal
45 ∫ 52	NC	—	(Not connected)
53	OSC 2	I	Clock input terminal (4.2336MHz)
54	OSC 1		
55	X1	—	(Not used, connected to GND)
56	X0	—	(Not used, open)
57	V_{SS} (GND)	—	GND terminal
58	DMUTE	O	Muting output (H: mute)
59	MDATA	O	Command data signal
60	MCLK	O	Command clock signal
61	$\overline{\text{MLD}}$	O	Command load signal (L: load)
62	TX (D. OUT)	—	(Not used, open)
63	EMPH	O	De-emphasis signal (Not used, open)
64	SERVO RST	O	Reset signal for servo circuit

• IC601 (MN187204PKX): System control & FL drive

Pin No.	Mark	I/O Division	Function
1 ~ 7	SEG 6 ~ SEG 0	O	Segment signal to FL display
8	V_{PP}	I	Power supply for FL drive
9	V_{CC}	I	Power supply terminal
10	OSC 2	I	System clock terminal (f=4.2336 MHz)
11	OSC 1		
12	GND	—	GND terminal
13 • 14	NC	—	(Not connected)
15 ~ 18	DATA 3 ~ DATA 0	O	Key scan signal
19	CLK	O	Data clock signal
20	ACK	O	Data discrimination signal
21	$\overline{SEND}$	O	Data transmission command signal
22	$\overline{RECV}$	O	Data receipt command signal
23 • 24	NC	—	(Not connected)

Pin No.	Mark	I/O Division	Function
25	BSDTO	O	Data signal for system control terminal
26	BSDTI	I	
27	BSCKO	O	Clock signal for system control terminal
28	BSCKI	I	
29	RESET	I	Reset signal terminal
30 ~ 35	KEY 5 ~ KEY 0	I	Key return signal
36	NC	—	(Not connected)
37	CM	—	Not used, connected to GND
38 ~ 41	NC	—	(Not connected)
42 ~ 45	CODE 1 ~ CODE 4	I	Search dial code signal (Not used, open)
46 ~ 55	DGT 0 ~ DGT 9	O	Digit signal to FL display
56 ~ 64	SEG 15 ~ SEG 7	O	Segment signal to FL display

• IC701 (AN8800SCE2): Servo amp

Pin No.	Mark	I/O Division	Function
1	LDG	I	APC loop gain select
2	LDP	I	APC monitor PD polarity select
3	LD	O	Laser power auto control output
4	LPD	I	LD power monitor PD signal
5	GND	—	GND terminal
6	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
7	AMP I	I	RF signal (X30 amp)
8	AMP O	O	
9	RF IN	I	RF AGC signal input
10	RF EQ	—	GND terminal
11	C. AGC	I	AGC detection capacitor input
12	ARF	O	RF signal output
13	C. SBDO	I	Dropout detection capacitor input
14	RF DET	O	RF detection signal ("L": detecting)
15	BDO	O	Dropout detection output
16	V_{CC}	I	Power supply terminal
17	SDO	O	Dropout detection pulse output
18	VAD+	O	Power supply terminal for A/D converter (+)
19	VREF	O	Reference voltage output
20	VAD−	O	Power supply terminal for A/D converter (−)
21	OFTR	O	Off track detection ("H": det.)

Pin No.	Mark	I/O Division	Function
22	PLAY	I	Play signal ("H": ON, "L": OFF)
23	WVEL	I	Double velocity ("H": double, "L": single)
24	TES	I	Tracking error shunt ("H": shunt, "L": output)
25	PTO	O	Potentio amp output
26	PTI	I	Potentio amp input
27	PBO	O	Potentio buffer output
28	POT	I	Potentio buffer input
29	CROSS	O	Tracking error zero cross output
30	TE	O	Tracking error signal
31	TE BAL	I	Oscillation det. signal
32	TBAL	I	Tracking balance adj. input
33	VDET	O	Oscillation det. signal ("H": det.)
34	FE	O	Focusing error signal
35	FBL 2	I	Focusing balance 2
36	FBL 1	I	Focusing balance 1
37	V_{CC}	I	Power supply terminal
38	GND	—	GND terminal
39	PDBD	I	Photo detector Bch input with delay
40	PDA	I	Photo detector Ach input without delay
41	PDB	I	Photo detector Ach input with delay
42	PDAD	I	Photo detector Bch input without delay

• IC703 (AN8377N): Traverse motor drive

Pin No.	Mark	I/O Division	Function
1	P V_{CC}	I	Drive power supply
2	V_{CC}	I	Power supply terminal
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVD1	I	Traverse error signal input
6	TD1	I	Tracking error signal input
7	FD1	I	Focus error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	FD+	O	Non-inverting output of focus driver
10	FD−	O	Inverting output of focus driver
11	TD+	O	Non-inverting output of tracking driver
12	TD−	O	Inverting output of tracking driver
13	TVD+	O	Non-inverting output of traverse driver
14	TVD−	O	Inverting output of driver
15	/RST	O	Reset signal output
16	PC	I	PC input (connect to GND)

• IC705 (MN6475): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	LRCK	I	L/R discriminating signal
2	BCLK	I	Serial bit clock input
3	SRDATA	I	Serial data output (MSB first)
4	COT 1	I	Test terminal (Ordinaly: L)
5	COT 2		
6	TEST		
7	V_{DD}	I	Digital power supply terminal
8	X2	O	Clock terminal (f=33.8688 MHz)
9	X1	I	
10	V_{SS}	—	Digital GND terminal
11	AV_{DD}. L	I	Analog power supply terminal 1
12	OUT. L	O	Analog signal output 1

Pin No.	Mark	I/O Division	Function
13	AV_{SS}. L	—	Analog GND terminal
14	AV_{SS}. R		
15	OUT. R	O	Analog signal output 2
16	AV_{DD}. R	I	Analog power supply terminal 2
17	/RST	I	Reset signal input (Active: L)
18	PWM	O	PWM output (TP···"H": output, "L": High impedance)
19	TP	I	Test terminal (ordinaly: L)
20	WVEL	I	Double velocity ("H": double, "L": single)
21	DEMPH	I	Digital de-emphasis ON/OFF ("H": ON)
22	CSEL	I	Clock frequency select of CK 192
23	192FS	O	192fs (8.4672MHz) signal output (Not used, open)
24	384/768FS	O	Clock output terminal (384fs=16.9344 MHz)

• IC704 (MN6650): Digital servo processor

Pin No.	Mark	I/O Division	Function
1	TES	O	Tracking error shunt signal ("H": shunt)
2	PLAY	O	Play signal ("H": play)
3	/RFDET	I	RF det. signal ("L": det.)
4	DO	I	Dropout signal ("H": dropout)
5	OFT	I	Off track signal ("H": off track)
6	ARF	I	RF signal input
7	WVEL	O	Double velocity status signal ("H": double)
8	PBO	I	Potensio buffer signal (analog input)
9	TE	I	Tracking error signal (analog input)
10	FE	I	Focus error signal (analog input)
11	VR2	I	Reference voltage for A/D (Low)
12	VR1	I	Reference voltage for A/D (High)
13	LDON	O	Laser power control ("H": ON)
14	V_{SS}	—	GND terminal
15	AV_{SS}	—	GND terminal
16	AV_{DD}	I	Power supply terminal
17	V_{DD}	I	Power supply terminal
18	TRV	O	Traverse servo control output
19	TVD	O	Traverse drive signal output
20	FOD	O	Focus drive signal output
21	TRD	O	Tracking drive signal output

Pin No.	Mark	I/O Division	Function
22	KICK	O	Kick pulse output
23	/TEST	I	Test terminal
24	V_{SS}	—	GND terminal
25	CLVS	I	Spindle servo phase synchro signal ("H": CLV, "L": Rough servo)
26	/TRON	O	Tracking servo ON signal ("L": ON)
27	MDATA	I	Command data signal
28	MCLK	I	Command clock signal
29	MLD	I	Command load signal ("L": LOAD)
30	SENSE	O	Sense signal
31	/FLOCK	O	Optical servo condition (focus) output
32	/TLOCK	O	Optical servo condition (tracking) output
33	/RST	I	Reset signal ("L": reset)
34	XI	I	Clock input (f=16.9344MHz)
35 ⟆ 38	T0 ⟆ T3	O	Test terminal (Ordinaly: open)
39 ⟆ 41	T4 ⟆ T6	I	Test terminal (Ordinaly: L)
42	VDET	I	Oscillation det. signal ("H": det.)
43	TBAL	O	Tracking balance adj. output
44	TRCRS	I	Track cross signal input

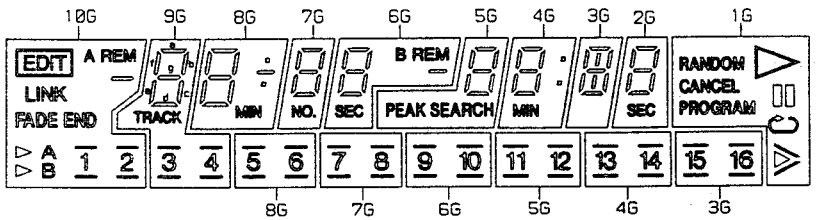
• IC706 (MN6626): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	AVSS	—	GND terminal
2	IREF	I	Reference current input
3	ARF	I	RF signal input
4	DRF	I	DSL bias terminal (Not used, open)
5	DSLF	I/O	DSL loop filter terminal
6	PLLF	I/O	PLL loop filter terminal
7	AVDD	I	Power supply terminal
8	RSEL	I	RF signal polarity setting terminal (Not used, connected to VDD)
9 ⟆ 16	TBUS7 ⟆ TBUS0	O	Test terminal
17	FLAG	O	Flag terminal
18	IPFLAG	O	Interpolation flag terminal
19	FCLK	O	Crystal frame clock (Not used, open)
20	BYTCK	O	Byte clock (Not used, open)
21	WDCK	O	Word clock (Not used, open)
22	$\overline{RST}$	I	Reset terminal
23	TX	O	Digital audio signal
24	LDG	O	Lch deglitch signal (Not used, open)
25	RDG	O	Rch deglitch signal (Not used, open)
26	SRDATA	O	Serial data output (MSB first)
27	SCK	O	Serial bit clock output
28	LRCK	O	L/R discriminating signal
29	XCK	O	Crystal OSC terminal (f=16.9344MHz)
30	PMCK	O	Frequency division clock signal (Not used, open) ($f=\frac{1}{192}\times CK=88.2kHz$)
31	CSEL	I	Test terminal (Connected to GND)
32	PSEL		
33	X1	I	Crystal OSC terminal (f=16.9344MHz)
34	X2	O	
35	VSS	—	GND terminal
36	SUBQ	O	Sub-code Q data
37	SQCK	I	Sub-code Q register clock
38	$\overline{CLDCK}$	O	Sub-code frame clock (f=7.35kHz) (Not used, open)

Pin No.	Mark	I/O Division	Function
39	BLKCK	O	Sub-code block clock (f=75Hz)
40	DEMPH	O	De-emphasis ON signal ("H": ON)
41	MEMP	I	Emphasis signal
42	MLD	I	Command load signal ("L": LOAD)
43	MCLK	I	Command clock signal
44	MDATA	I	Command data signal
45	D MUTE	I	Muting input ("H": MUTE)
46	SMCK	O	System clock (f=4.2336MHz)
47	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
48	CRC	O	Sub-code CRC check terminal ("H": OK, "L": NG)
49	SUBC	O	Sub-code serial output data (Not used, open)
50	SBCK	I	Sub-code serial output clock (Not used, open)
51	$\overline{TRON}$	I	Tracking servo ON signal ("L": ON)
52	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo)
53	PC	O	Turntable motor ON signal ("L": ON)
54	ECM	O	Turntable motor drive signal (Forced mode)
55	ECS	O	Turntable motor drive signal (Servo error signal)
56	VDD	I	Power supply terminal
57	$\overline{TEST}$	I	Test terminal (Normal: "H")
58	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)
59	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz)
60	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
61	DO	I	Drop-out detection signal ("H": Drop-out) (Not used, connected to GND)
62	EFM	O	EFM signal (Not used, open)
63	PCK	O	PLL extract clock (f=4.3218MHz)
64	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)

■ INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	▷ (A)	a	a	a	a	a	a	a	a	▷
P2	▷ (B)	b	b	b	b	b	b	b	b	▯▯
P3	LINK	c	c	c	c	c	c	c	c	↻
P4	-	d	d	d	d	d	d	d	d	/
P5	-	e	e	e	e	e	e	e	e	▷
P6	EDIT A/B	f	f	f	f	f	f	f	f	/
P7	FADE END	g	g	g	g	g	g	g	g	CANCEL
P8	-	TRACK	MIN	NO.	SEC	SEARCH	MIN	/	SEC	-
P9	⇨	-	-	-	-	PEAK	-	-	-	RANDOM
P10	A REM	-	:	-	B REM	-	:	-	-	PROGRAM
P11	(1)	(3)	(5)	(7)	(9)	(11)	(13)	(15)	-	-
P12	1	3	5	7	9	11	13	15	-	-
P13	(1)	(3)	(5)	(7)	(9)	(11)	(13)	(15)	-	-
P14	(2)	(4)	(6)	(8)	(10)	(12)	(14)	(16)	-	-
P15	2	4	6	8	10	12	14	16	-	-
P16	(2)	(4)	(6)	(8)	(10)	(12)	(14)	(16)	-	-

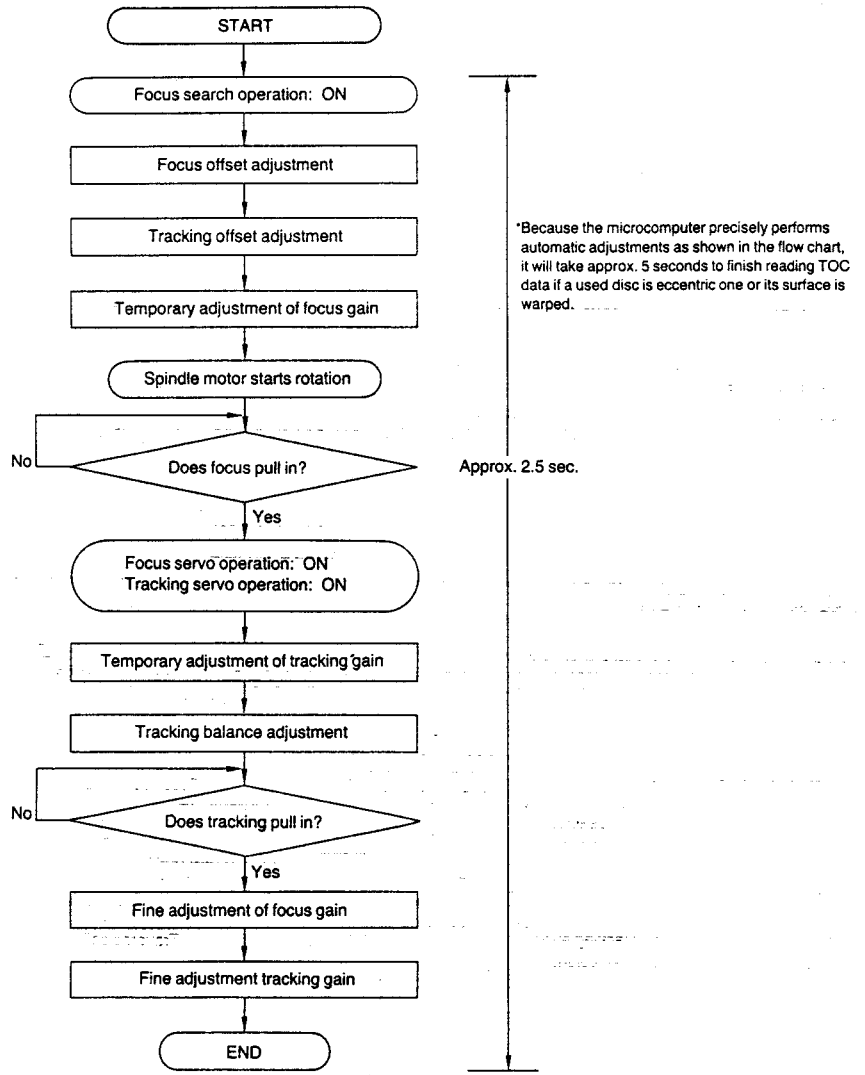
• Pin connection

PIN NO.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68
CONNECTION	F F N P P P P P P P P P P P P P P P N N N N N N P P P P 1 1 1

2. The servo processor IC MN6650 of the newly-developed digital servo circuit automatically performs the following adjustments which were originally adjusted in the conventional analog servo circuit:
(1) Focus offset, (2) Tracking offset, (3) Focus gain, (4) Tracking gain, and (5) Tracking balance. Therefore, you do not have to perform the above-mentioned electrical adjustments manually. Only the best eye (PD balance) needs to be adjusted. You can obtain an optimum servo control for a disc to be played.
[You must perform the best eye (PD balance) adjustment manually.]

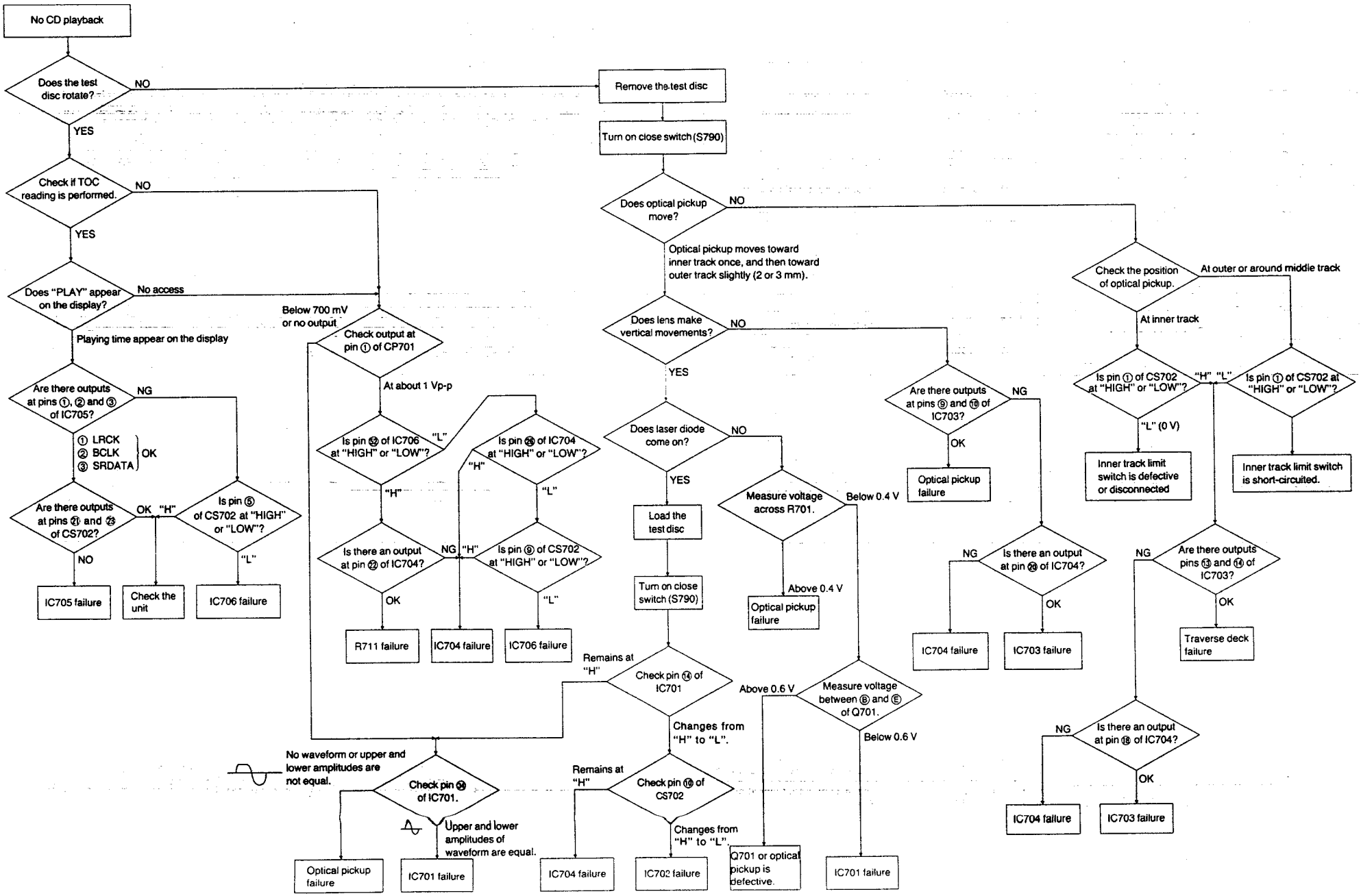
The following flow chart shows the sequence of automatic adjustments.

•Flow chart on automatic adjustment sequence

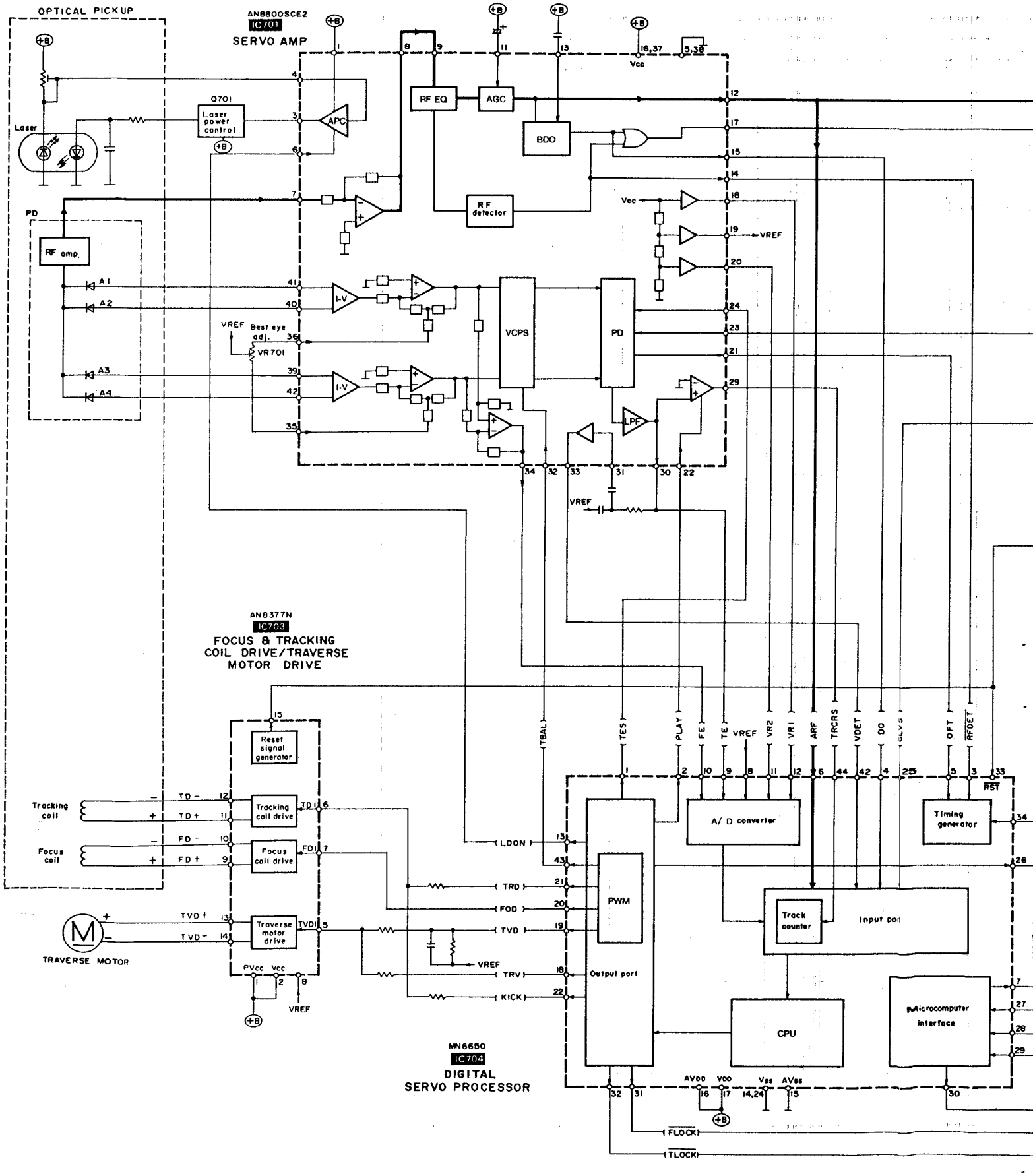


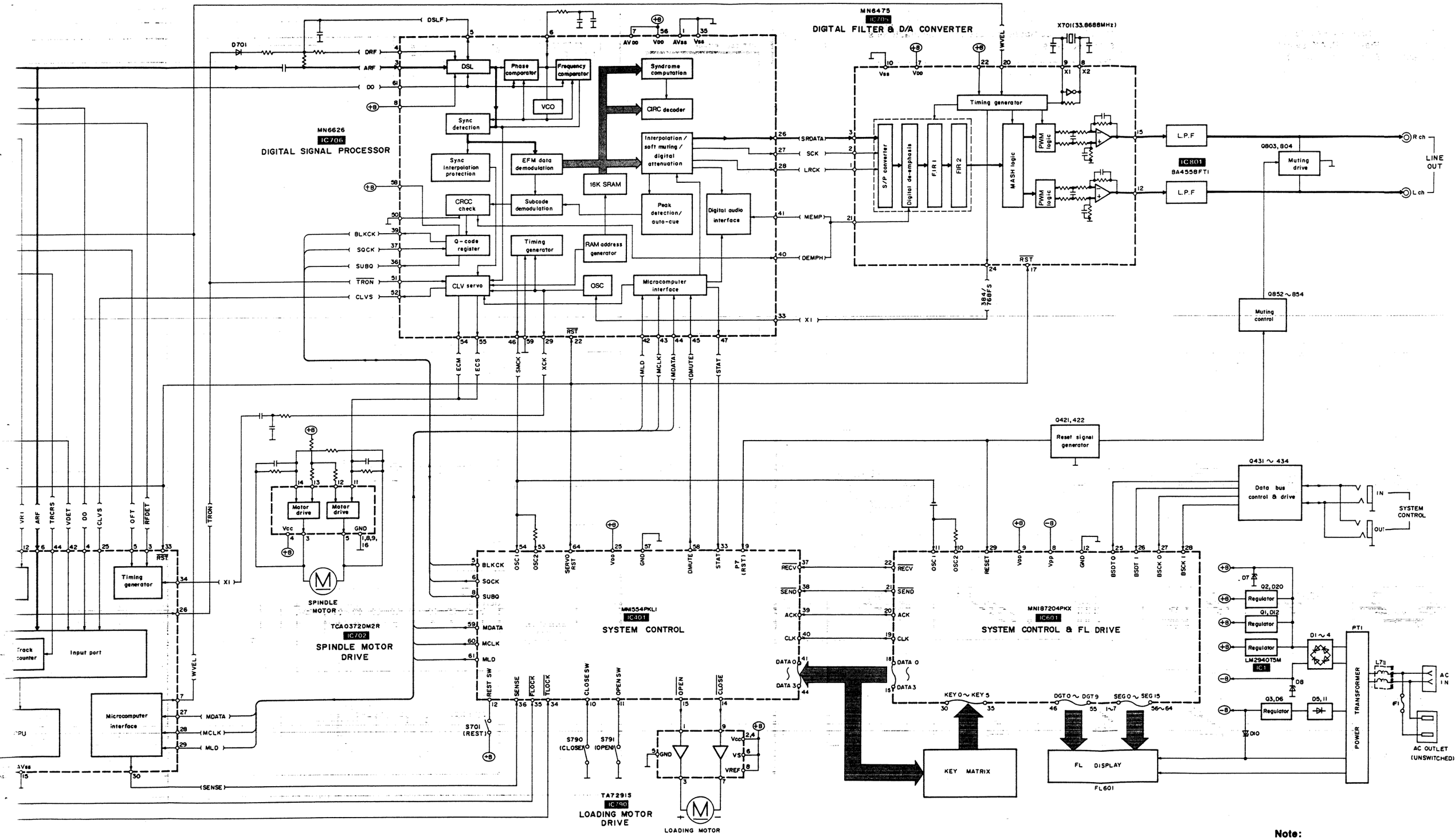
*Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.

■ TROUBLESHOOTING GUIDE



■ BLOCK DIAGRAM





Note:
→ Audio signal

■ SCHEMATIC DIAGRAM (Parts list on pages 42~45.)

(This schematic diagram may be modified at any time with development of new technology.)

Note:

- **S601** : Disc holder open/close (▲ OPEN/CLOSE) switch.
- **S602** : Stop (■ STOP) switch.
- **S603** : Pause (▮▮ PAUSE) switch.
- **S604** : Play (▷ PLAY) switch.
- **S605, 606** : Skip (⏮ SKIP ⏭) switches. [S605: ⏮, S606: ⏭]
- **S607, 608** : Search (◀◀ SEARCH ▶▶) switches. [S607: ◀◀, S608: ▶▶]
- **S609** : Repeat play (REPEAT) switch.
- **S610** : Program (PROGRAM) switch.
- **S611** : Power (STANDBY ⏻ /ON) switch.
- **S612** : Edit mode (NORMAL, TAPE LENGTH) switch.
- **S613** : Tape side select (SIDE A/B) switch.
- **S614** : Random play (RANDOM) switch.
- **S701** : Rest detector switch in "off" position.
- **S701A** : Voltage adj. switch in "240V" position. [For (GC) area only.] (110V↔127V↔220V↔240V)
- **S790** : Disc holder "close" detector switch.
- **S791** : Disc holder "open" detector switch.

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

  The supply part number is described alone in the replacement parts list.

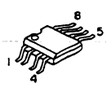
Part No.	Original Part No.	Supply Part No.
IC1	LM2940T5M	LM2940T5
IC801	BA4558FT1	SVIBA4558F

- ▬▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
  ▒▒▒ : audio signal lines.

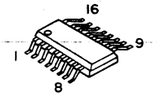
Caution!
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

• Terminal guide of IC's, transistors and diodes

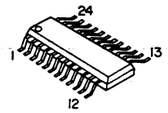
BA4558FT1



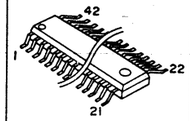
TCA0372DM2R



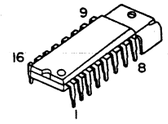
MN6475



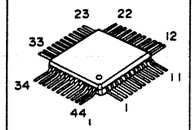
AN8800SCE2



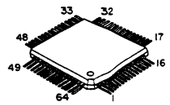
AN8377N



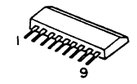
MN6650



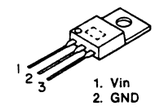
MN1554PKL1
MN187204PKX
MN6626



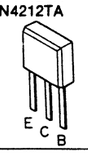
TA7291S



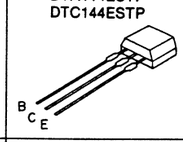
LM2940T5M



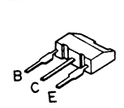
2SC3311QRSTA
UN4112TA
UN4212TA



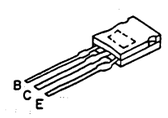
2SD2144STA
DTA114ESTP
DTC144ESTP



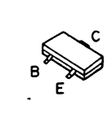
2SB1238QSTV6
2SD1862QRTV6



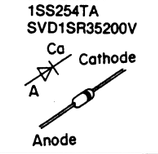
2SD2037EFTA



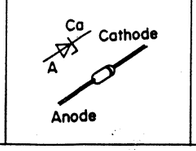
2SB709STW



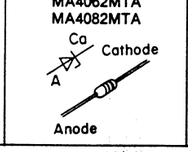
MA700ATA
1SS254TA
SVD1SR35200V



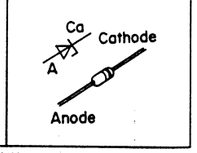
SVDMTZ8R2B



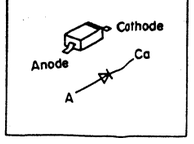
MA4039HTA
MA4062MTA
MA4082MTA



MA4330MTA



MA110TW



A SERVO CIRCUIT

OPTICAL PICKUP

Q701
2SB709STW
LASER POWER DRIVE

IC701
AN8800SCE2
SERVO AMP

IC704
MN6650
DIGITAL SERVO PROCESSOR

IC706
MN6626
DIGITAL SIGNAL PROCESSOR

IC705
MN6475
DIGITAL FILTER & D/A CONVERTER

IC702
TCA0372DM2R
SPINDLE MOTOR DRIVE

IC703
AN8377N
TRAVERSE MOTOR DRIVE / COIL DRIVE

Best eye adj

TRACKING COIL

FOCUS COIL

TEST CONNECTOR

SPINDLE MOTOR

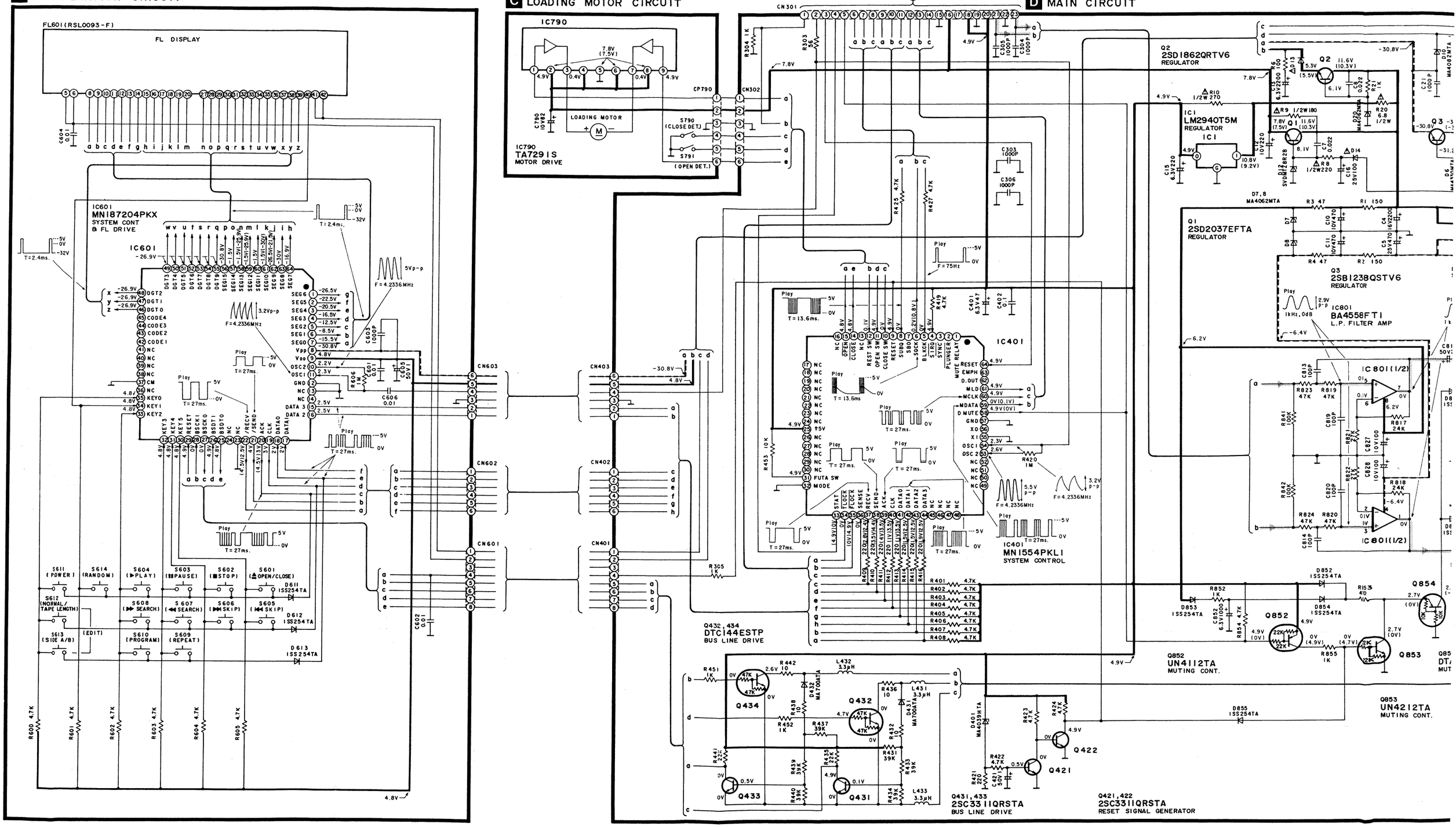
TRAVERSE MOTOR

S701 (REST)

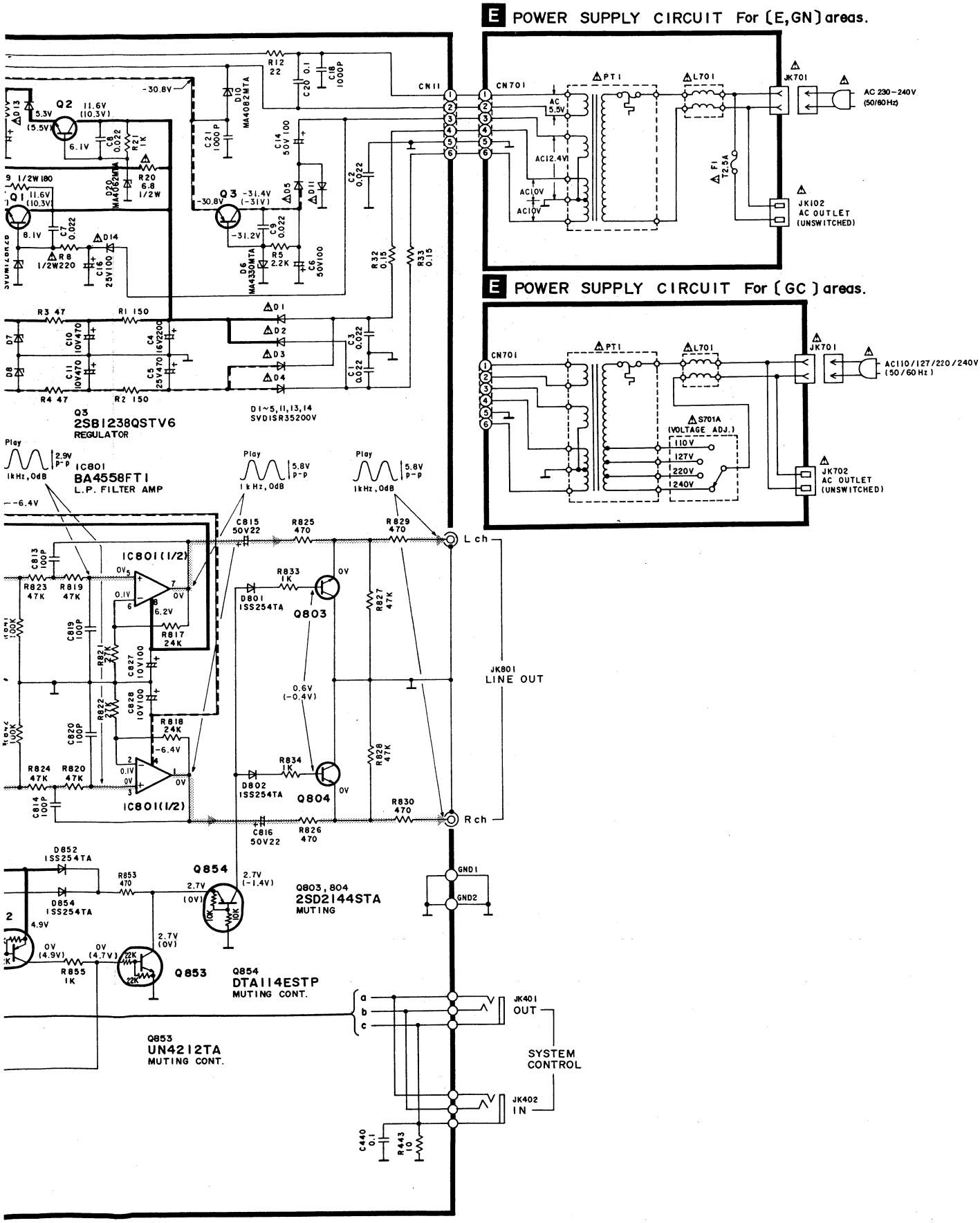
B FL/OPERATION CIRCUIT

C LOADING MOTOR CIRCUIT

D MAIN CIRCUIT

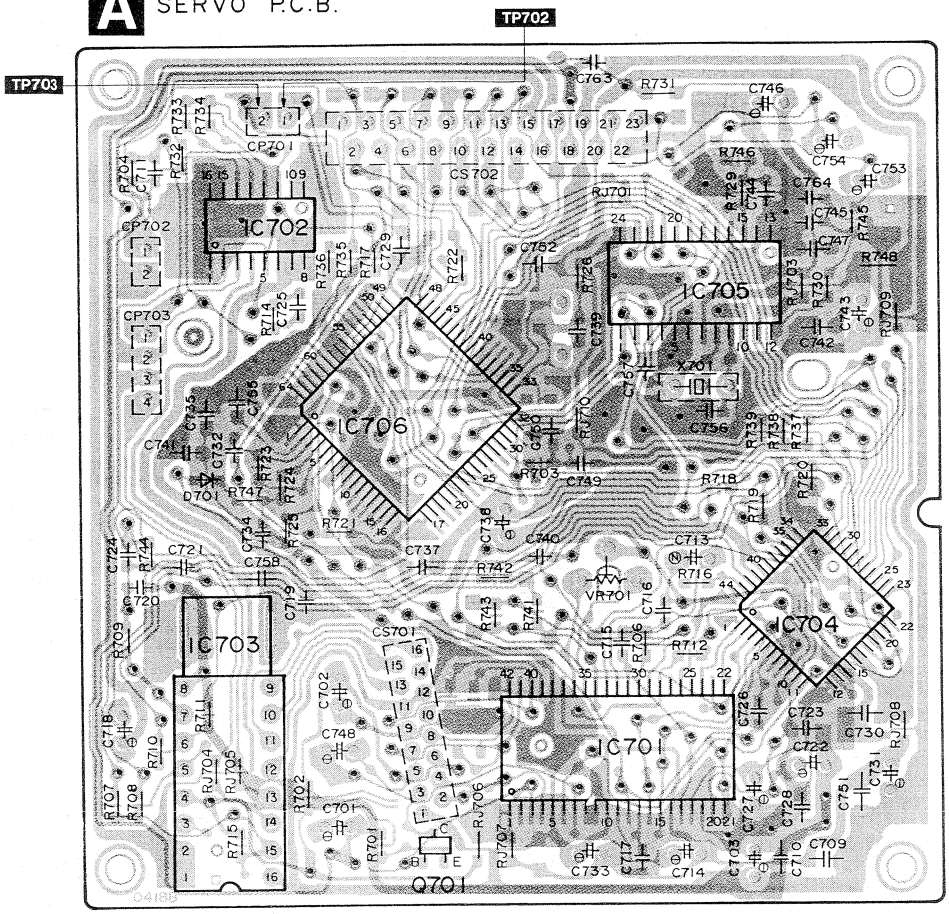


20 21 22 23 24

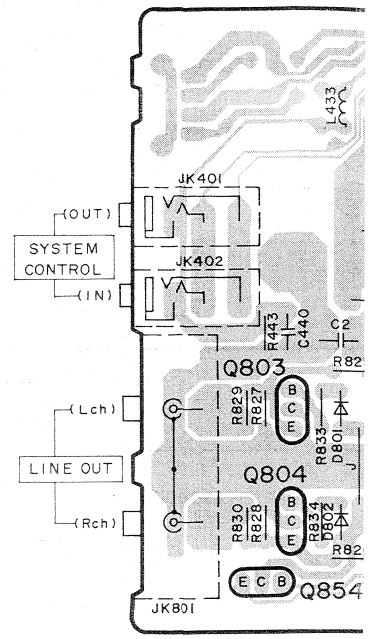

E POWER SUPPLY CIRCUIT For (E,GN) areas.
CN701
PT1
L701
JK701
AC 230-240V (50/60Hz)
AC 5.5V
AC12.4V
AC10V
AC10V
F1 T2.5A
JK102 AC OUTLET (UNSWITCHED)
E POWER SUPPLY CIRCUIT For (GC) areas.
CN701
PT1
L701
JK701
AC110/127/220/240V (50/60Hz)
S701A (VOLTAGE ADJ.)
110V
127V
220V
240V
JK702 AC OUTLET (UNSWITCHED)
CN11
-30.8V
Q2 11.6V (10.3V)
5.3V (5.5V)
6.1V
Q1 11.6V (10.3V)
8.1V
Q3 -31.4V (-31V)
-30.8V
-31.2V
R12 22
C18 1000P
C20 0.1
D10 MA4082MTA
C21 1000P
C14 50V100
C2 0.022
D11
D5
C9 0.022
R5 2.2K
C6 50V100
D6 MA4330MTA
R32 0.15
R33 0.15
R20 6.8 1/2W
R8 1/2W220
C16 25V100
D14
C7 0.022
R3 47
R1 150
R4 47
R2 150
D1
D2
D3
D4
C1 0.022
C3 0.022
C4 16V2200
C5 25V470
C10 10V470
C11 10V470
Q3 2SB1238QSTV6 REGULATOR
D1~5,11,13,14 SVDISR35200V
IC801 BA4558FTI L.P. FILTER AMP
Play 2.9V p-p 1kHz,0dB
Play 5.8V p-p 1kHz,0dB
Play 5.8V p-p 1kHz,0dB
-6.4V
IC801(1/2)
IC801(1/2)
C815 50V22
R825 470
R829 470
L ch
R833 1K
D801 ISS254TA
Q803
R827 47K
JK801 LINE OUT
0.6V (-0.4V)
R834 1K
D802 ISS254TA
Q804
R828 47K
R830 470
R826 470
C816 50V22
R Ch
R823 47K
R819 47K
R824 47K
R820 47K
R817 24K
R818 24K
C819 100P
C820 100P
C827 10V100
C828 10V100
C813 100P
C814 100P
D852 ISS254TA
D854 ISS254TA
R853 470
Q854
2.7V (-1.4V)
2.7V (0V)
Q803,804 2SD2144STA MUTING
GND1
GND2
4.9V
0V (4.9V)
0V (4.7V)
2.7V (0V)
R855 1K
Q853
Q854 DTA114ESTP MUTING CONT.
Q853 UN4212TA MUTING CONT.
a
b
c
JK401 OUT
SYSTEM CONTROL
JK402 IN
C440 0.1
R443 10

PRINTED CIRCUIT BOARDS

A SERVO P.C.B.



D MAIN P.C.B.



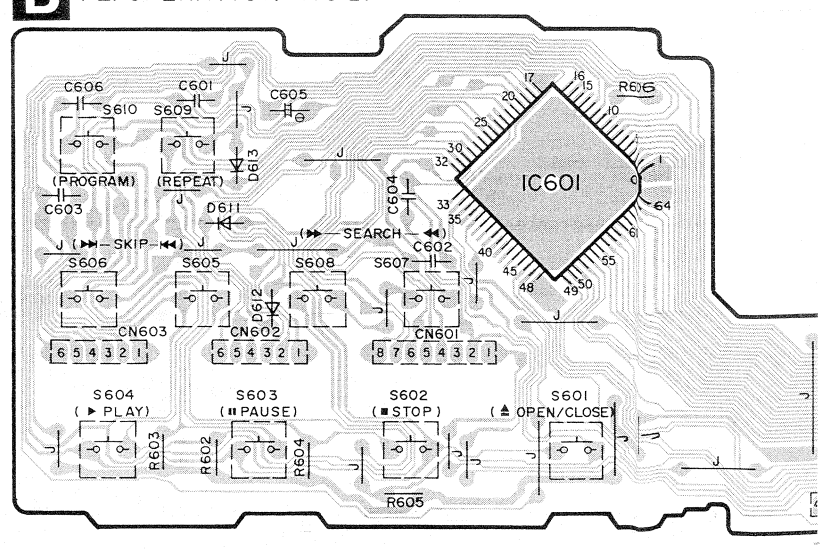
Notes:

This diagram shows a front view of the small outline type IC mounting surface.

1. The circuit shown in ( ) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in ( ) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

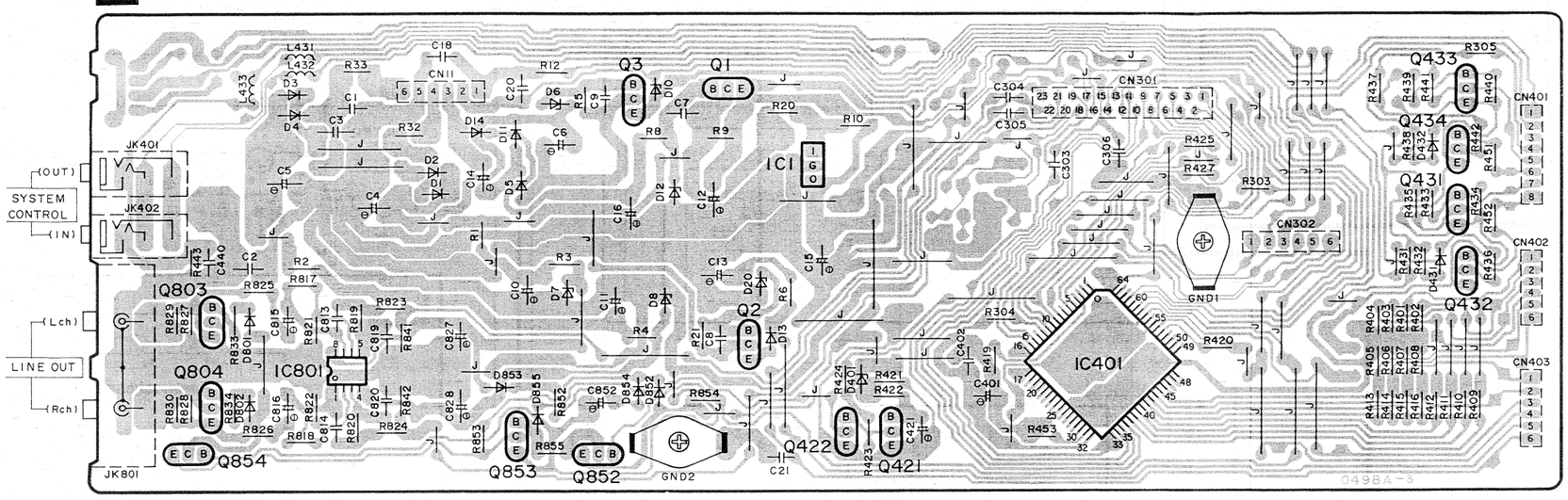
• This circuit board diagram may be modified at any time with the developement of new technology.

B FL/OPERATION P.C.B.

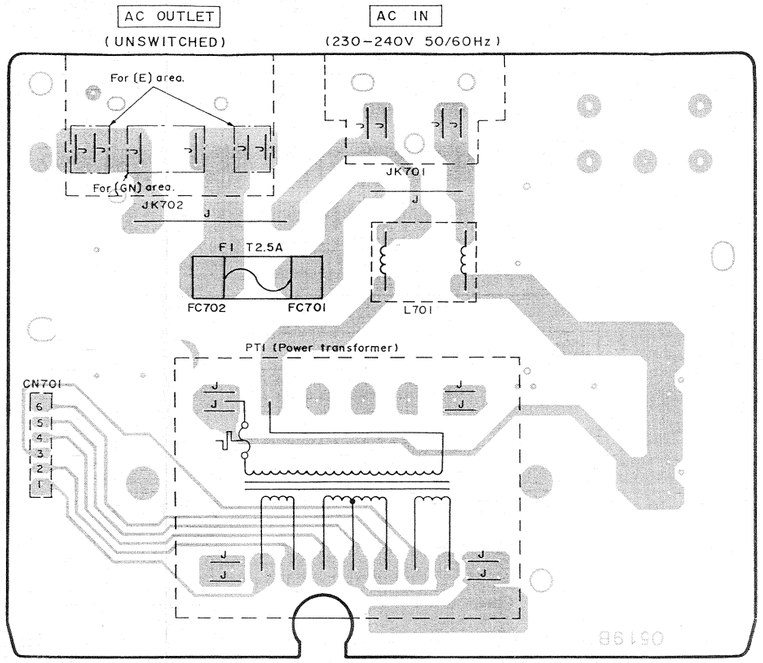


5 6 7 8 9 10 11 12 13 14

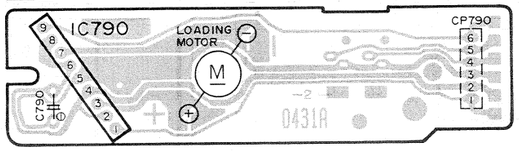
D MAIN P.C.B.

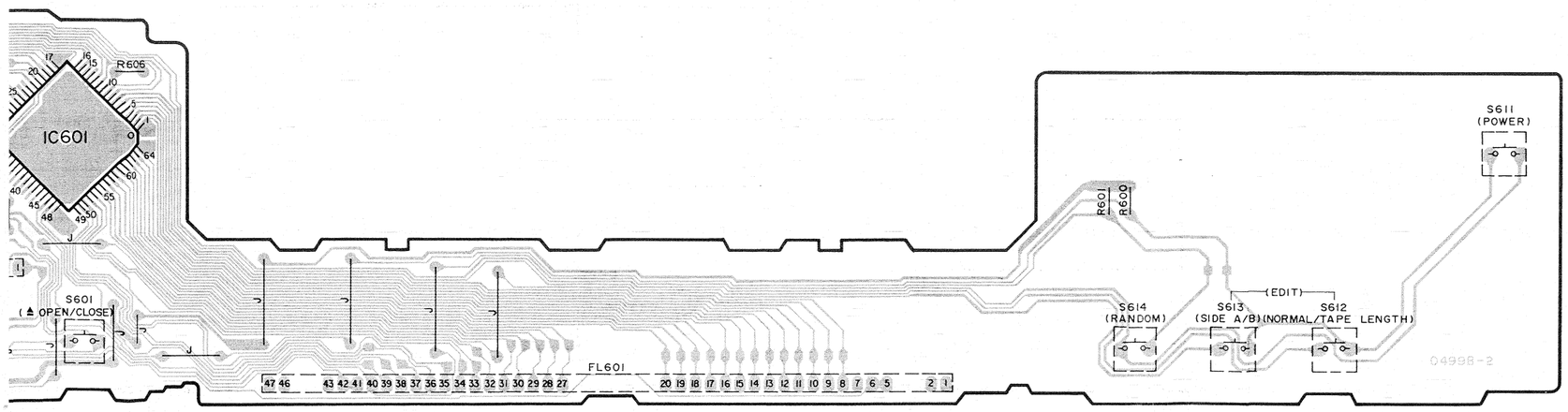


E POWER SUPPLY P.C.B. For (E,GN) areas.

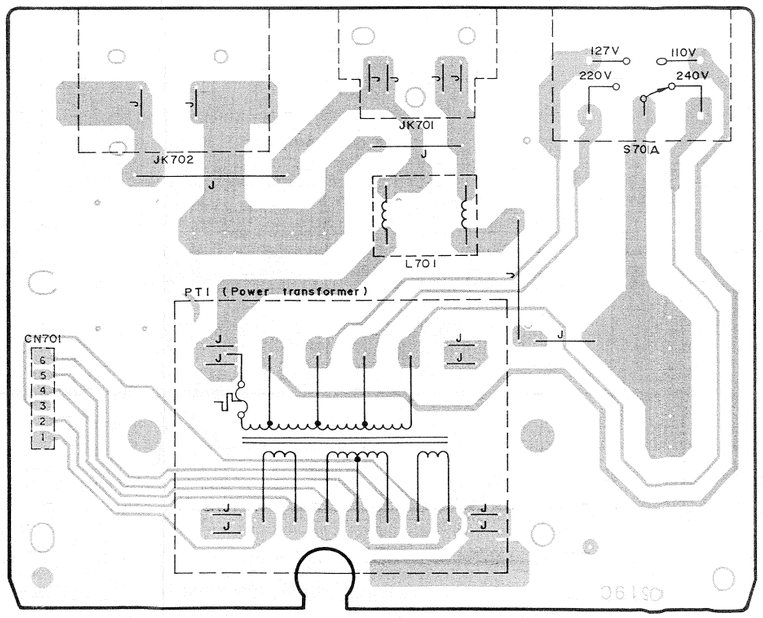


C LOADING MOTOR P.C.B.

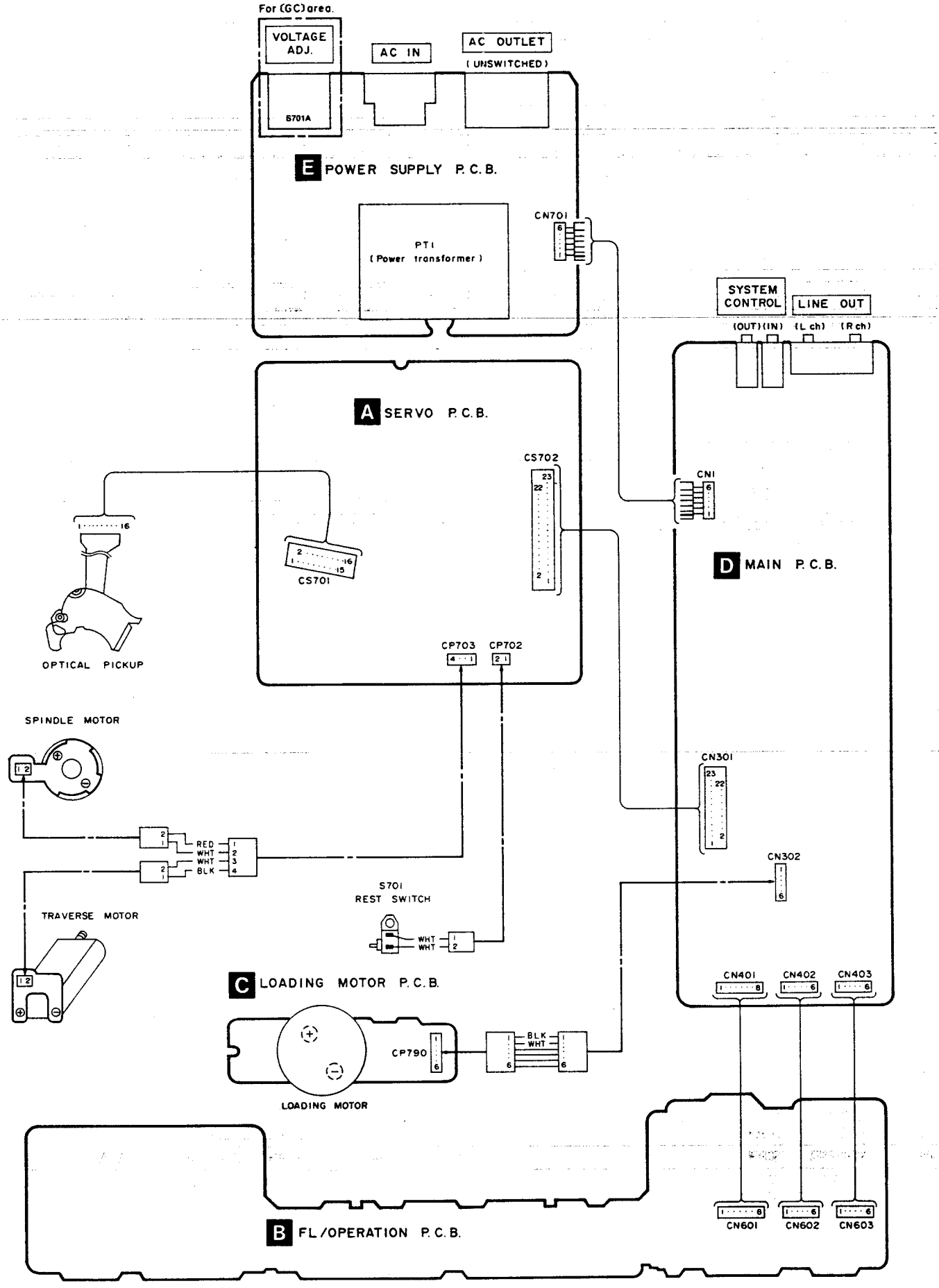




E POWER SUPPLY P.C.B. For (GC) area.



■ WIRING CONNECTION DIAGRAM



■ REPLACEMENT PARTS LIST

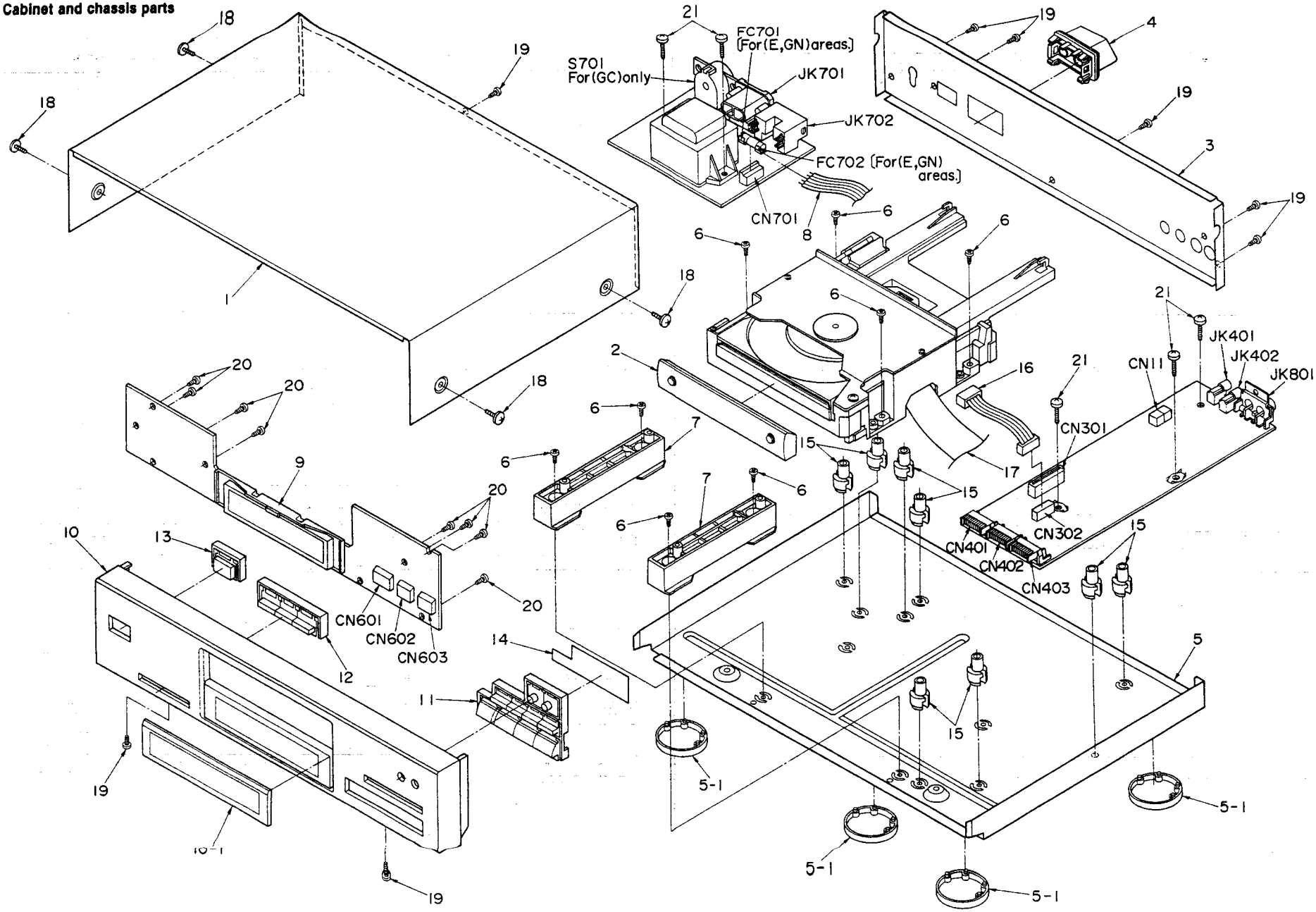
Notes : • Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
• The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
* Warning: This product uses a laser diode. Refer to caution statements on page 3.
* ACHTUNG:
Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RGMD139-K	CABINET	
2	RGMD287-K	TRAY ORNAMENT	
3	RGRD098K-A1	REAR PANEL	(E)
3	RGRD098L-A2	REAR PANEL	(GC)
3	RGRD098M-A1	REAR PANEL	(GN)
4	RJS1A4902-A	AC OUTLET COVER	(E)
4	SJS9331A	AC OUTLET COVER	(GC)
4	RJS1A4602	AC OUTLET COVER	(GN)
5	RFKJSX502E-K	CHASSIS ASS'Y	
5-1	RKAD011-2	FOOT	
6	XTB3+8JFZ	SCREW	
7	RMRD343	MECH SPACER	
8	RWJ18061950Q	FLAT CABLE(6P)	
9	RMND094	FL HOLDER	
10	RFKGLPJ28E-K	FRONT PANEL ASS'Y	
10-1	RKWD118-K1	WINDOW	
11	RGUD435-K	MAIN BUTTON	
12	RGUD436-K	SUB BUTTON	
13	RGUD437-K1	POWER BUTTON	
14	RMQD226	BUTTON SHEET	
15	SHE187-2	P. C. B. SUPPORT	
16	REXD354	CONNECTOR ASS'Y(6P)	
17	RWJ5223150EX	FLAT CABLE(23P)	
18	RHD30007	SCREW	
19	XTBS3+8JFZ1	SCREW	
20	XTBS26+8J	SCREW	
21	XTB3+20JFZ	SCREW	
		TRAVERSE DECK	
301	REMD019	LOADING MOTOR ASS'Y	
302	RMKD105	CHASSIS	
303	RMED063	SPRING, LOCK LEVER	
304	RMGD158	BELT, RUBBER	
305	RMLD177	LEVER, CONVERSION	
306	RMLD178	LEVER, LOCK	
307	RMMD058	SLIDE PLATE(1)	
308	XYN2+6G	SCREW	
309	XYN2+F6FZ	SCREW	
310	RHD20010	SCREW	
311	RMUD046	TRAY GUIDE SHAFT	
312	RHD20009-1	SCREW	
313	RMAD328	SHUTTER HOLDER	
314	RGQD066-K	TRAY(B)	

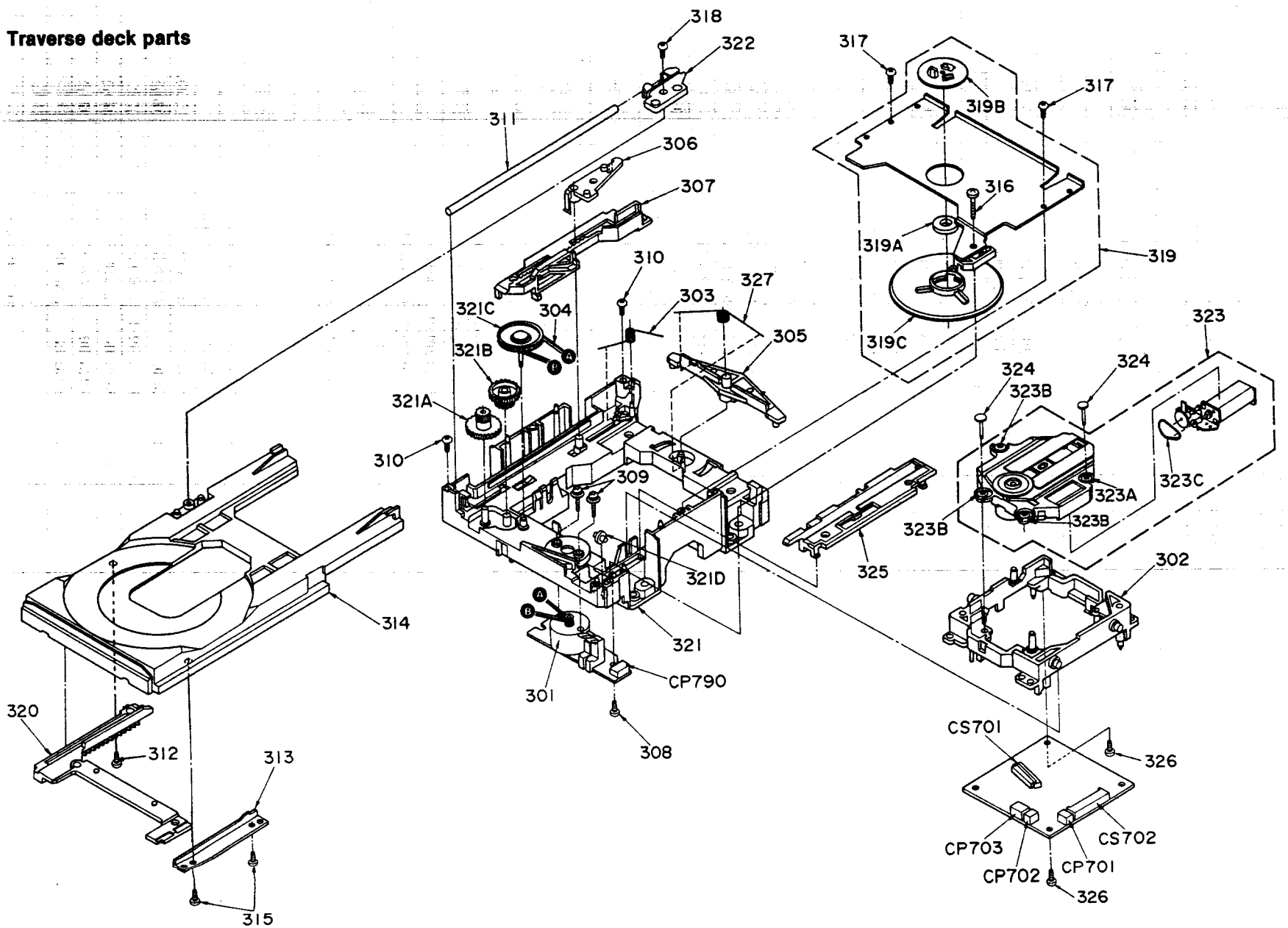
Ref. No.	Part No.	Part Name & Description	Remarks
315	XTN2+8G	SCREW	
316	XTB3+25GFZ	SCREW	
317	XTN26+6G	SCREW	
318	XTN3+8JFZ	SCREW	
319	RXQD122	CLAMPING PLATE ASS'Y	
319A	RHM245ZA	MAGNET	
319B	RMRD334	FIXED PLATE	
319C	RXQD123	MAGNET HOLDER ASS'Y	
320	RFKNLDN7N-K	DRIVE GEAR(2) ASS'Y	
321	RFKJXDT77-H	MECHANICAL CHASSIS ASS'Y	
321A	RDGD142	RELAY GEAR	
321B	RDGD143	DRIVE GEAR(1)	
321C	RDPD041	RELAY PULLEY	
321D	SDRD14	ROLLER(B)	
322	RFKNXDT77C-H	GUIDE HOLDER ASS'Y	
323	SDDD110Z	TRAVERSE DECK UNIT	⚠
323A	SHGD112	FLOATING RUBBER(A)	
323B	SHGD113-1	FLOATING RUBBER(B)	
323C	RDVD014	BELT, RUBBER	
324	RMSD123-1	FIXED PIN	
325	RMMD059	SLIDE PLATE(2)	
326	XTV26+6G	SCREW	
327	RMED087	SPRING, ASSISTANCE	
		PACKING MATERIAL	
P1	RPGD852	PACKING CASE	
P2	RPND413-1	PAD	
P3	RPQD164	ACCESSORIES PAD	
P4	SPSD152	ACCESSORIES BOX	
P5	XZB60X60A01	PROTECTION BAG(UNIT)	
P6	XZB23X20C03	PROTECTION BAG(CORD)	
P7	RPND540	TRANSPORTATION PLATE	
		ACCESSORIES	
A1	RFKSLPJ28E-K	INST. MANUAL ASS'Y	(E)
A1	RQTD937-G	INSTRUCTION MANUAL	(GC, GN)
A2	RQAD013	WARRANTY CARD	(E)
A2	SQX7186	WARRANTY CARD	(GN)
A3	RQCB0169	SERVICENTER LIST	
A4	SJA187	AC POWER SUPPLY CORD	(E)⚠
A4	RJAD004	AC POWER SUPPLY CORD	(GC)⚠
A4	SJA173	AC POWER SUPPLY CORD	(GN)⚠
A5	SJP2249-3	STEREO CONNECTION CABLE	
A6	SJP2257T	L-TYPE CABLE	
A7	SJP9215	POWER PLUG ADAPTOR	(GC)⚠

■ EXPLODED VIEWS

• Cabinet and chassis parts



• **Traverse deck parts**



■ REPLACEMENT PARTS LIST

Notes : • Important safety notice:
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* ACHTUNG:
Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC1	LM2940T5	IC, REGULATOR	
IC401	MN1554PKL1	IC, SYSTEM CONTROL	
IC601	MN187204PKX	IC, SYSTEM CONTROL&FL DRIVE	
IC790	TA7291S	IC, LOADING MOTOR DRIVE	
IC801	SVIBA4558F	IC, L. P. F.	
		TRANSISTOR(S)	
Q1	2SD2037EFTA	TRANSISTOR	
Q2	2SD1862QRTV6	TRANSISTOR	
Q3	2SB1238QSTV6	TRANSISTOR	
Q421, 422	2SC3311A-Q	TRANSISTOR	
Q431	2SC3311A-Q	TRANSISTOR	
Q432	DTC144EKT96	TRANSISTOR	
Q433	2SC3311A-Q	TRANSISTOR	
Q434	DTC144EKT96	TRANSISTOR	
Q803, 804	2SD2144S	TRANSISTOR	
Q852	UN4112	TRANSISTOR	
Q853	UN4212TA	TRANSISTOR	
Q854	DTA114ESTP	TRANSISTOR	
		DIODE(S)	
D1-5	SVD1SR35200A	DIODE	⚠
D6	MA4330MTA	DIODE	
D7, 8	MA4062MTA	DIODE	
D10	MA4082MTA	DIODE	
D11	SVD1SR35200A	DIODE	⚠
D12	SVDMTZ8R2B	DIODE	
D13, 14	SVD1SR35200A	DIODE	⚠
D20	MA4062MTA	DIODE	
D401	MA4039HTA	DIODE	
D431, 432	MA700	DIODE	
D611-613	1SS254TA	DIODE	
D801, 802	1SS254TA	DIODE	
D852-855	1SS254TA	DIODE	
		COIL(S)	
L431-433	RLQZP3R3KT-Y	COIL	
L701	RLQZ600M-W	COIL	⚠
		DISPLAY TUBE	

Ref. No.	Part No.	Part Name & Description	Remarks
FL601	RSL0093-F	DISPLAY TUBE	
		SWITCH(ES)	
S601	EVQ21405R	SW, OPEN/CLOSE	
S602	EVQ21405R	SW, STOP	
S603	EVQ21405R	SW, PAUSE	
S604	EVQ21405R	SW, PLAY	
S605	EVQ21405R	SW, R. SKIP	
S606	EVQ21405R	SW, F. SKIP	
S607	EVQ21405R	SW, R. SEARCH	
S608	EVQ21405R	SW, F. SEARCH	
S609	EVQ21405R	SW, REPEAT	
S610	EVQ21405R	SW, PROGRAM	
S611	EVQ21405R	SW, POWER	
S612	EVQ21405R	SW, EDIT MODE	
S613	EVQ21405R	SW, SIDE A/B	
S614	EVQ21405R	SW, RANDOM	
S701A	SSR187-1	SW, VOLTAGE ADJ.	(GC)⚠
S790	RSH1A005	SW, CLOSE DETECTOR	
S791	RSH1A005	SW, OPEN DETECTOR	
		CONNECTOR(S) & SOCKET(S)	
CN11	RJS1A6806	CONNECTOR(6P)	
CN301	RJS1A6823	CONNECTOR(23P)	
CN302	RJT029W06VT	CONNECTOR(6P)	
CN401	RJU003K008M1	SOCKET(8P)	
CN402, 403	RJU003K006M1	SOCKET(6P)	
CN601	RJT003K008M1	CONNECTOR(8P)	
CN602, 603	RJT003K006M1	CONNECTOR(6P)	
CN701	SJT30643-V	CONNECTOR(6P)	
CP790	RJP6G17ZA	CONNECTOR(6P)	
		JACK(S)	
JK401	RJJ33T01	SYSTEM CONTROL	
JK402	RJJ33T01	SYSTEM CONTROL	
JK701	SJS9236	AC INLET	(E, GC)⚠
JK701	SJSD16	AC INLET	(GN)⚠
JK702	RJS1A4902-B	AC OUTLET	(E)⚠
JK702	SJS9331B	AC OUTLET	(GC)⚠
JK702	RJS1A8102	AC OUTLET	(GN)⚠
JK801	RJH1201N	LINE OUT	
		FUSE HOLDER(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
FC701, 702	EYF52BC	FUSE HOLDER	(E, GN)⚠
		TRANSFORMER(S)	
PT1	RTP1K4B012	POWER TRANSFORMER	(E, GN)⚠
PT1	RTP1K4E020	POWER TRANSFORMER	(GC)⚠
		FUSE(S)	
F1	XBA2C25TB0	FUSE, 2.5A 250V	(E, GN)⚠
		GND PLATE(S)	
GND1, 2	SNE1004-1	GND PLATE	
		<SERVO P. C. B.>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8800SCE2	IC, SERVO AMP	
IC702	TCA0372DM2R	IC, SPINDLE MOTOR DRIVE	
IC703	AN8377N	IC, TRAVERSE MOTOR DRIVE	
IC704	MN6650	IC, DIGITAL SERVO PROCESSOR	
IC705	MN6475	IC, DIGITAL FILTER&D/A CONV.	
IC706	MN6626	IC, DIGITAL SIGNAL PROCESSOR	
		TRANSISTOR(S)	
Q701	2SB709STW	TRANSISTOR	
		DIODE(S)	
D701	MA110TW	DIODE	
		VARIABLE RESISTOR(S)	
VR701	EVNDXAA00B14	V. R, BEST EYE ADJ.	
		OSCILLATOR(S)	
X701	RSXZ33M8M01T	OSCILLATOR(33.8688MHz)	
		SWITCH(ES)	
S701	SSHD5	SW, REST DETECTOR	
		PLUG(S) & SOCKET(S)	
CP701	RJP2G17ZA	PLUG(2P)	
CP702	RJP2G17ZA	PLUG(2P)	
CP703	RJP4G17ZA	PLUG(4P)	
CS701	RJU035T016-1	SOCKET(16P)	

Ref. No.	Part No.	Part Name & Description	Remarks
CS702	RJS1A6723-1Q	SOCKET(23P)	

RESISTORS & CAPACITORS

Notes : • Capacity valuse are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
• Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k (OHM)

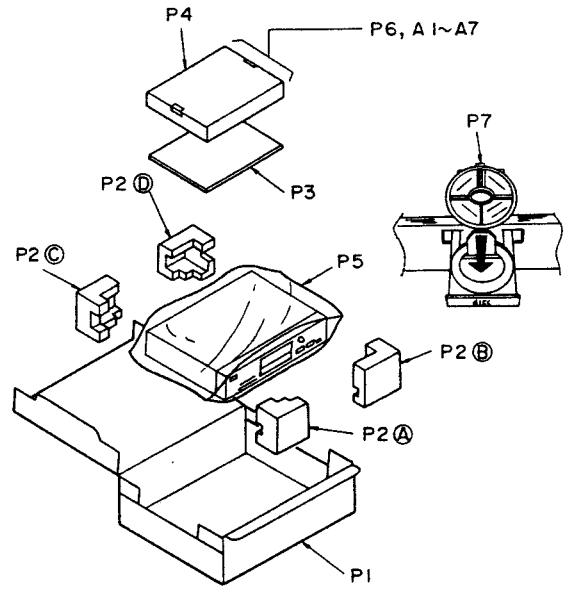
Ref. No.	Part No.	Values & Remarks
		RESISTORS
R1, 2	ERDS2TJ151	1/4W 150
R3, 4	ERDS2TJ470	1/4W 47
R5	ERDS2TJ222	1/4W 2.2K
R6	ERDS2TJ101	1/4W 100
R8	ERDS1FVJ221T	1/2W 220 ⚠
R9	ERDS1FVJ181T	1/2W 180 ⚠
R10	ERDS1FVJ271T	1/2W 270 ⚠
R12	ERDS2TJ220T	1/4W 22
R20	ERDS1FVJ6R8T	1/2W 6.8 ⚠
R21	ERDS2TJ102	1/4W 1K
R32, 33	ERQ1GNWR15E	1W 0.15
R303	ERDS2TJ560T	1/4W 56
R304, 305	ERDS2TJ102	1/4W 1K
R401-408	ERDS2TJ472	1/4W 4.7K
R409-416	ERDS2TJ221	1/4W 220
R419	ERDS2TJ472	1/4W 4.7K
R420	ERDS2TJ105T	1/4W 1M
R421	ERDS2TJ221	1/4W 220
R422-425	ERDS2TJ472	1/4W 4.7K
R427	ERDS2TJ472	1/4W 4.7K
R431	ERDS2TJ393	1/4W 39K
R432	ERDS2TJ100	1/4W 10
R433, 434	ERDS2TJ393	1/4W 39K
R435	ERDS2TJ223	1/4W 22K
R436	ERDS2TJ100	1/4W 10
R437	ERDS2TJ393	1/4W 39K
R438	ERDS2TJ100	1/4W 10
R439, 440	ERDS2TJ393	1/4W 39K
R441	ERDS2TJ223	1/4W 22K
R442, 443	ERDS2TJ100	1/4W 10
R451, 452	ERDS2TJ102	1/4W 1K
R453	ERDS2TJ103	1/4W 10K
R600-605	ERDS2TJ472	1/4W 4.7K
R606	ERDS2TJ105T	1/4W 1M
R817, 818	ERDS2TJ243T	1/4W 24K
R819, 820	ERDS2TJ473	1/4W 47K
R821, 822	ERDS2TJ273	1/4W 27K
R823, 824	ERDS2TJ473	1/4W 47K
R825, 826	ERDS2TJ471	1/4W 470
R827, 828	ERDS2TJ473	1/4W 47K
R829, 830	ERDS2TJ471	1/4W 470
R831, 834	ERDS2TJ102	1/4W 1K
R841, 842	ERDS2TJ104	1/4W 100K
R852	ERDS2TJ102	1/4W 1K
R853	ERDS2TJ471	1/4W 470
R854	ERDS2TJ472	1/4W 4.7K

Ref. No.	Part No.	Values & Remarks
R855	ERDS2TJ102	1/4W 1K
		CAPACITORS
C1-3	ECKT1H223ZF	50V 0.022U
C4	ECA1CM222B	16V 2200U
C5	ECA1EM471B	25V 470U
C6	ECA1HM101B	50V 100U
C7-9	ECKT1H223ZF	50V 0.022U
C10, 11	ECA1AM471B	10V 470U
C12	ECEA1AKA221Q	10V 220U
C13	ECA0JM222B	6.3V 2200U
C14	ECA1HM101B	50V 100U
C15	ECEA0JKA221B	6.3V 220U
C16	ECA1EM101B	25V 100U
C18	ECBT1H102KB5	50V 1000P
C20	ECFR1E104ZF5	25V 0.1U
C21	ECBT1H102KB5	50V 1000P
C303-306	ECBT1H102KB5	50V 1000P
C401	ECEA0JKA470B	6.3V 47U
C402	ECFR1E104ZF5	25V 0.1U
C421	ECEA1HKA010B	50V 1U
C440	ECFR1E104ZF5	25V 0.1U
C601, 602	ECBT1E1032F	25V 0.01U
C603	ECBT1H102KB5	50V 1000P
C604	ECBT1E1032F	25V 0.01U
C605	ECEA1HKS010	50V 1U
C606	ECBT1E1032F	25V 0.01U
C790	ECA1AKF820E	10V 82U
C813, 814	ECBT1H101KB5	50V 100P
C815, 816	ECEA1HKA220B	50V 22U
C819, 820	ECBT1H101KB5	50V 100P
C827, 828	ECEA1AKA101B	10V 100U
C852	ECA0JM102B	6.3V 1000U
		<SERVO P.C.B.>
		RESISTOR(S)
R701	ERJ6GEYJ100V	1/10W 10
R702	ERJ6GEYJ471V	1/10W 470
R703	ERJ6GEYJ102V	1/10W 1K
R704	ERJ6GEYJ103V	1/10W 10K
R706	ERJ6GEYJ473V	1/10W 47K
R707	ERJ6GEYJ222V	1/10W 2.2K
R708	ERJ6GEYJ683V	1/10W 68K
R709	ERJ6GEYJ122V	1/10W 1.2K
R710	ERJ6GEYJ182V	1/10W 1.8K
R711	ERJ6GEYJ473V	1/10W 47K

Ref. No.	Part No.	Values & Remarks
R712	ERJ6GEYJ471V	1/10W 470
R714	ERJ6GEYJ473V	1/10W 47K
R715	ERJ6GEYJ223V	1/10W 22K
R716	ERJ6GEYJ104V	1/10W 100K
R717	ERJ6GEYJ682V	1/10W 6.8K
R718	ERJ6GEYJ223V	1/10W 22K
R719	ERJ6GEYJ123V	1/10W 12K
R720	ERJ6GEYJ273V	1/10W 27K
R721	ERJ6GEYJ823V	1/10W 82K
R722	ERJ6GEYJ102V	1/10W 1K
R723	ERJ6GEYJ104V	1/10W 100K
R724	ERJ6GEYJ104V	1/10W 100K
R725	ERJ6GEYJ471V	1/10W 470
R726	ERJ6GEYJ102V	1/10W 1K
R729	ERJ6GEYJ102V	1/10W 1K
R730	ERJ6GEYJ102V	1/10W 1K
R731	ERJ8GEYJ470V	1/8W 47
R732	ERJ6GEYJ562V	1/10W 5.6K
R733	ERJ6GEYJ332V	1/10W 3.3K
R734	ERJ6GEYJ562V	1/10W 5.6K
R735	ERJ6GEYJ222V	1/10W 2.2K
R736	ERJ6GEYJ682V	1/10W 6.8K
R737	ERJ6GEYJ562V	1/10W 5.6K
R738	ERJ6GEYJ562V	1/10W 5.6K
R739	ERJ6GEYJ562V	1/10W 5.6K
R741	ERJ6GEYJ102V	1/10W 1K
R742	ERJ6GEYJ102V	1/10W 1K
R743	ERJ6GEYJ102V	1/10W 1K
R744	ERJ6GEYJ393V	1/10W 39K
R745	ERJ6GEYJ102V	1/10W 1K
R746	ERJ6GEYJ102V	1/10W 1K
R747	ERJ6GEYJ473V	1/10W 47K
R748	ERJ8GEYJ180V	1/8W 18
		JUMPER(S)
RJ701	ERJ6GEY0R00V	CHIP JUMPER
RJ703	ERJ6GEY0R00V	CHIP JUMPER
RJ704	ERJ6GEY0R00V	CHIP JUMPER
RJ705	ERJ6GEY0R00V	CHIP JUMPER
RJ706	ERJ6GEY0R00V	CHIP JUMPER
RJ707	ERJ6GEY0R00V	CHIP JUMPER
RJ708	ERJ6GEY0R00V	CHIP JUMPER
RJ709	ERJ6GEY0R00V	CHIP JUMPER
RJ710	ERJ6GEY0R00V	CHIP JUMPER
		CAPACITOR(S)
C701	ECEA0JKS2201	6.3V 22U

Ref. No.	Part No.	Values & Remarks
C702	ECEA0JKS4701	6.3V 47U
C703	ECEA0JKS101I	6.3V 100U
C709	ECUV1C224KBM	16V 0.22U
C710	ECUV1C104MBM	16V 0.1U
C711	ECUV1E103MBN	25V 0.01U
C713	ECEA1CSN4R7I	16V 4.7U
C714	ECEA1HKS0101	50V 1U
C715	ECUV1H472KBN	50V 4700P
C716	ECUV1C473KBN	16V 0.047U
C717	ECUV1H681KBN	50V 680P
C718	ECEA1AKS101I	10V 100U
C719	ECUV1E103MBN	25V 0.01U
C720	ECUV1E153MBN	25V 0.015U
C721	ECUV1E103MBN	25V 0.01U
C722	ECEA0JKS4701	6.3V 47U
C723	ECUV1C104MBM	16V 0.1U
C724	ECUV1E333MBN	25V 0.033U
C725	ECUV1E103MBN	25V 0.01U
C726	ECUV1H471KBN	50V 470P
C727	ECEA0JKS470I	6.3V 47U
C728	ECUV1C104MBM	16V 0.1U
C729	ECUV1C104MBM	16V 0.1U
C730	ECUV1C224KBM	16V 0.22U
C731	ECEA0JKS331I	6.3V 330U
C732	ECUV1H102MBN	50V 1000P
C733	ECEA0JKS101I	6.3V 100U
C734	ECUV1E223MBN	25V 0.022U
C735	ECUV1C224KBM	16V 0.22U
C737	ECUV1C224KBM	16V 0.22U
C738	ECEA0JKS101I	6.3V 100U
C739	ECUV1E103MBN	25V 0.01U
C740	ECUV1H472MBN	50V 4700P
C741	ECUV1C224KBM	16V 0.22U
C742	ECUV1C104MBM	16V 0.1U
C743	ECEA0JKS331I	6.3V 330U
C744	ECUV1H102KBN	50V 1000P
C745	ECUV1H102KBN	50V 1000P
C746	ECEA0JKS101I	6.3V 100P
C747	ECUV1C104MBM	16V 0.1U
C748	ECEA1HKS010I	50V 1U
C749	ECUV1E103MBN	25V 0.01U
C750	ECUV1H050DCN	50V 5P
C751	ECUV1C224KBM	16V 0.22U
C752	ECUV1C104MBM	16V 0.1U
C753	ECEA1HKS010	50V 1U
C754	ECEA1HKS010	50V 1U
C755	ECUV1C104MBM	16V 0.1U
C756	ECUV1H050DCN	50V 5P
C757	ECUV1H050DCN	50V 5P
C758	ECUV1C224KBM	16V 0.22U
C763	ECUV1E103MBN	25V 0.01U
C764	ECUV1H331KBN	50V 330P

PACKING



(P2 Ⓐ Ⓑ Ⓒ Ⓓ : part No. RPN0413-1)

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